The RUBBER AGE

November, 1945

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DEC 11 1945


# AGERITE ALBA

*in*

## WHITE *and* BRIGHT COLORED GOODS

**From one-half to one per cent of AGERITE ALBA on the rubber hydrocarbon (non-staining type) is beneficial in white and bright colored goods. This benefit is shown by fade-ometer tests and by light exposure tests in Florida.**

**R. T. VANDERBILT CO., Inc.**

**230 Park Avenue, New York City**

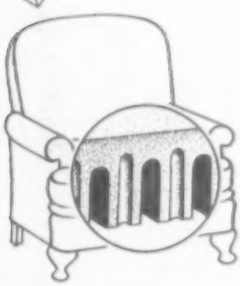
**Newsletter No. 11**
NOVEMBER, 1945

*Published by Rubber Chemicals Division of* DU PONT

# NEOPRENE LATEX

## HAS NEVER COST SO LITTLE AS NOW!

Why not review your plans for the sale of latex products with greater emphasis on neoprene latex?



Many manufacturers have found that they can make practically any latex product from neoprene latex. They have found also that these articles can be made without extensive alteration of established processes and that the articles themselves are superior for the intended uses to the rubber products previously made.

The value of neoprene latex to the latex industry has been demonstrated under difficult conditions during the war emergency. It will prove equally valuable in the manufacture of the industry's peacetime products. The recent price reduction means a great improvement in the economic picture for postwar articles.

There is plenty of neoprene latex available. Shipments are made promptly in tank cars, drum carloads and trucks.

**BUY AND HOLD VICTORY BONDS**

**Commercial Neoprene Latices:**

Type 571—50% solids—for general purpose use.

Type 572—50% solids—for fast setting adhesives.

Type 571 Conc. and Type 60—59% solids—for foam sponge, dipped goods and other items requiring high solids.

**Outstanding Properties:**

*Resistance to*

| | |
|---|---|
| Flame | Chemicals |
| Sunlight | Oxidation |
| Oils | |

**Low Prices:**

Tank cars of Type 571 at 25c per lb. See our new Neoprene Latex Price Schedule.

**Literature:**

Know-how on the use of neoprene latex for many applications is available. Tell us your problem and let us send you our bulletins which apply. Ask for our new report BL-201, "The Neoprene Latices."

DU PONT

# RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . *Through Chemistry*

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. November, 1945, Vol. 58, No. 2.

# HYCAR advertising is building a quality market for you

HYCAR PISTON PERFECT FOR TOUGHEST OIL FIELD PUMPING SERVICE
Handles drilling mud, cement, acid up to 10,000 psi
AN easy way to waste a good many thousand dollars is to let a cement pump fail while either the casing or tubing in an oil well is filled with cement. That's why Halliburton Oil Well Cementing Company—known for the care with which its experts select each item that goes into a pumping unit—uses pump pistons made from Hycar synthetic rubber. That way they can be sure that failures won't occur.
The same units handle drilling mud and acidizing fluids with equal assurance of perfect performance. That's because Hycar provides a combination of properties that enables it to tackle and lick the really tough jobs where other materials fail. High abrasion resistance; resistance to oils, acids, most chemicals; ability to stay resilient and maintain a positive seal; these are just a few reasons why Hycar is practically the standard resilient material in the petroleum industry. Other important properties of Hycar are shown in the box at the right. They'll help you understand why Hycar is the ideal material for gate packers, mud line valves, blow-out preventers, gaskets and hose of all kinds, and many other items where these properties are needed.
Ask your supplier for parts made of Hycar. Test them in your own applications—difficult or routine.
Learn for yourself that Hycar can help you reduce operating costs—that it's wise to use Hycar for long-time, dependable service. Hycar Chemical Company, Akron 8, Ohio.
WHAT HYCAR DOES IN OIL FIELD APPLICATIONS
1. Resists oil and gas—even under high pressures and temperatures.
2. Resists action of abrasive-laden fluid under high pressure and at high velocity.
3. Wears at slow rate even under severe conditions.
4. Makes a positive, leak-proof seal, even after a long period of service.
5. Provides high elasticity.
6. Gives high tensile strength.
7. Has minimum tendency to cold flow and compression set.
Hycar
Reg. U. S. Pat. Off.
LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE
Synthetic Rubbers

HERE is a typical HYCAR advertisement designed and published for just one purpose—to help *you* make more sales of parts made from HYCAR. A HYCAR message similar to this one appears each month in general, business, and selected trade papers with a combined circulation of over 1,000,000 readers, many of whom are *your* direct prospects.

We encourage these prospects to "ask for parts made from HYCAR" because we know that they will get the most economical, most dependable product performance from this *quality* material. And that in turn means that you can sell *up*—improve sales quality instead of merely meeting so-called competition.

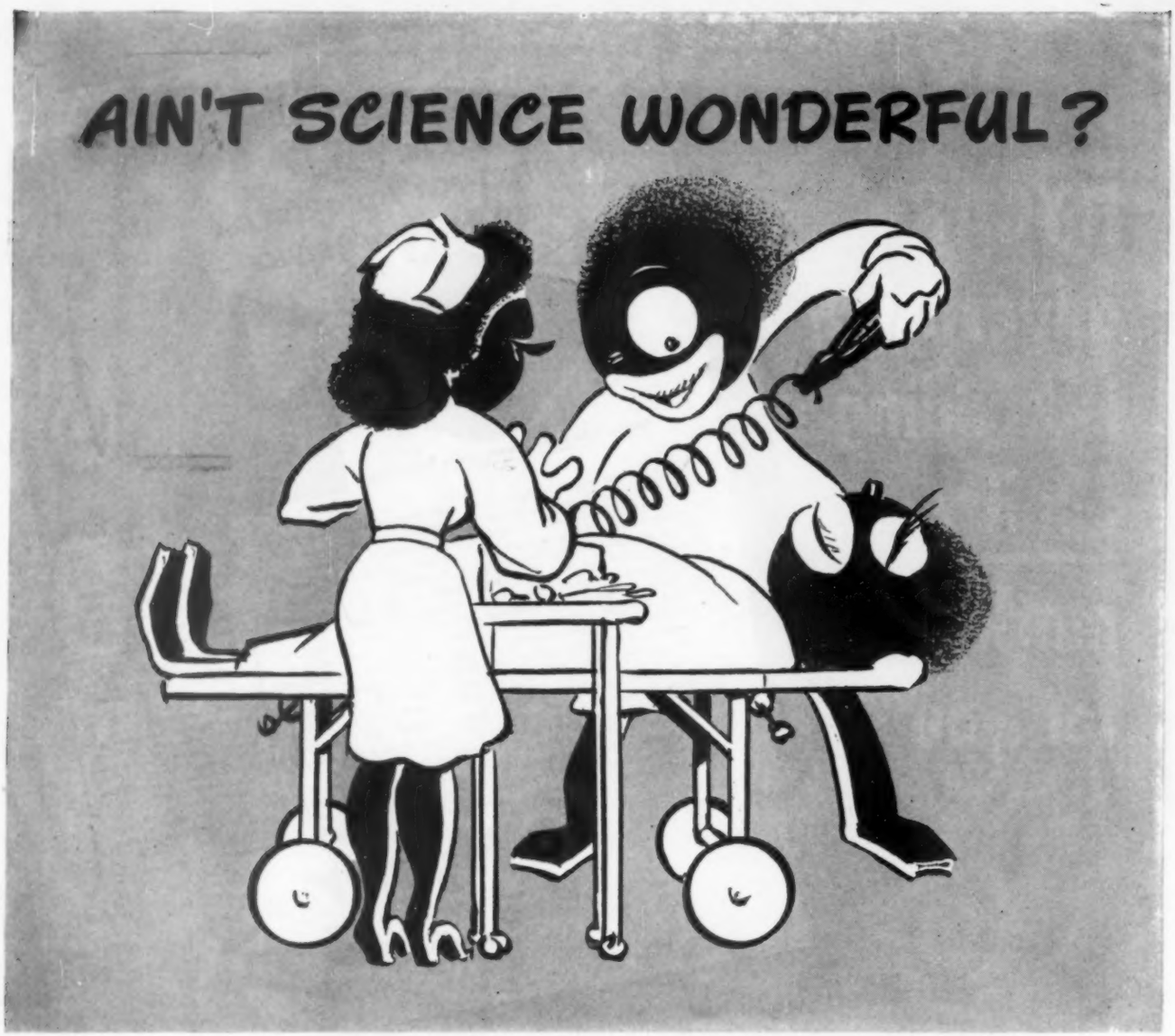
We make no finished parts from HYCAR. We simply supply you with the raw synthetic rubber for fabrication into quality products. But we're trying to help you establish a quality market, and we plan to continue this long range selling program for you. Reprints of all HYCAR advertisements are available at no charge for use by your salesmen. Just write *Hycar Chemical Company, Akron 8, O.*

**Hycar**

Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

*Synthetic Rubbers*




**To remove the nerve from synthetic** is only a minor operation with Philblack A! And, in addition, there are other beneficial results from the treatment.

For example—Philblack A gives tires long life, because they are more resistant to cut and crack growth, have lower heat build-up and good abrasion resistance. Faster, smoother tubing—lower loadings—no mold cooling (at 200°F. better tensile strength than EPC).

If you are really interested in better products and easier, surer methods of manufacturing them, prescribe Philblack A.

**PHILLIPS PETROLEUM COMPANY**

*Philblack* *Division*

FIRST CENTRAL TOWER BUILDING · AKRON, OHIO

*Cases developed and manufactured by Hood Rubber Co.*

# ..suggest broad general uses for Geon

*Possibilities include luggage, cameras, footwear, packaging and upholstery materials, and many others*

DUE to several particularly nasty kinds of mildew, leather cases for binocular and other delicate optical instruments literally fell apart after a few days in the South Pacific early in the war. Then corrosive salt air or the humid air of the jungle got to the instruments and quickly ruined them.

That was soon corrected, however, thanks to the kind of cases you see in the picture. They are made from GEON polyvinyl materials combined with a reinforced plastic core. Mildew—even the meanest kind—has no harmful effect. Salt air or steaming jungle temperatures leave the GEON unchanged. The cases are waterproof and wearproof. They last indefinitely.

Just these few properties of GEON suggest many interesting and important applications. Scuff-resistant, good-looking, practically indestructible luggage and brief cases; upholstery material that can be left outdoors because it is highly resistant to weathering; water and mildew proof fabric coatings for rainwear, shower curtains, tents; soles and heels that will outwear leather many times; film, sheet or coatings of GEON for packages that will resist wear, aging, chemicals, foods, tobacco, oils and greases, moisture, heat and cold. All products made from GEON may be brilliantly or delicately colored.

There will be applications for GEON in every industry in America. For more complete information write Department KK-11, B.F.Goodrich Chemical Company, 324 Rose Building, East 9th and Prospect, Cleveland 15, Ohio.

Geon
Polyvinyl Materials

**B. F. Goodrich Chemical Company**

A DIVISION OF THE B. F. GOODRICH COMPANY

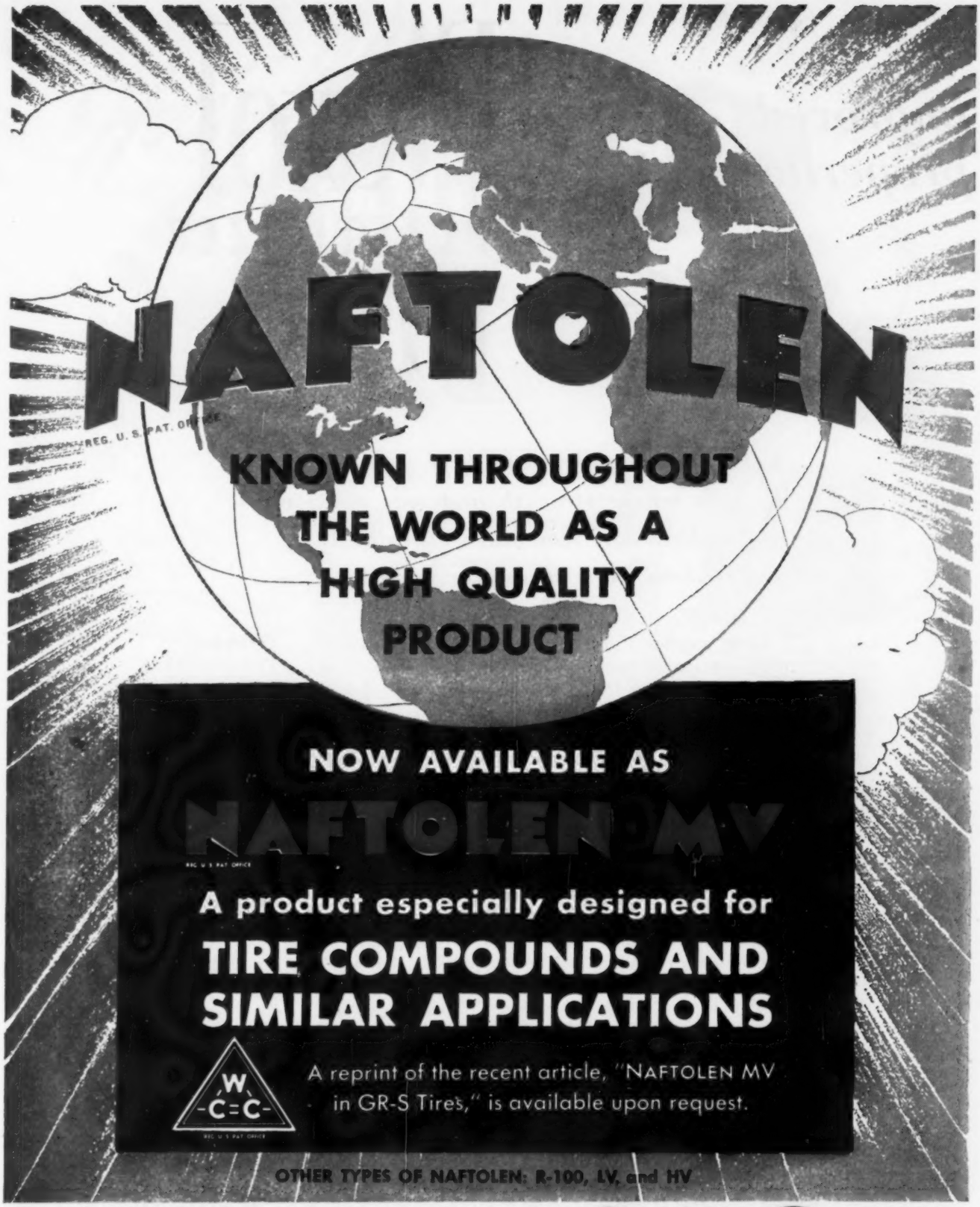
THAT man in the picture is handling merchandise that's one of the biggest bargains that can be offered the rubber industry. It's Philadelphia Reclaimed rubber.

It's a bargain because, for many purposes, it is still the most economical compounding material that can be found anywhere. It's stable and dependable—easy to use and easy to get results with.

Philadelphia Reclaim won't ever completely replace either natural or synthetic rubber. They both have their established places. But Philadelphia Reclaim has its established place, too. Within its field, Philadelphia Reclaim can offer the rubber industry economy of manufacture of quality products, a low selling price for the finished product, and a fair margin of profit, even in highly competitive markets.

All of Philadelphia Rubber's research facilities and experience are yours to draw upon in the solution of any problem having to do with reclaimed rubber—natural or synthetic. Just write Philadelphia Rubber Works Company, Rose Building, Cleveland 15, Ohio.

**PHILADELPHIA**
**RECLAIMED RUBBER**




# WILMINGTON

## CHEMICAL CORPORATION

10 EAST 40TH STREET • NEW YORK 16, N. Y.

*improved properties with . . .*

# Flexol PLASTICIZER DOP

★ *Permanence of flexibility—*

★ *High tensile strength and tear resistance—*

★ *Excellent low temperature flexibility—*

★ *Freedom from plasticizer "sweat-out"—*

These and many other improvements in plasticized resinous materials have been made possible by the use of "Flexol" plasticizer DOP and other plasticizers supplied by Carbide and Carbon Chemicals Corporation.

"Flexol" plasticizer DOP (diethylhexyl phthalate) is a water-insoluble, non-volatile liquid with excellent heat and light stability, good electrical properties, and wide compatibility with resinous materials.

Five years of use as an all-purpose plasticizer for the vinyl resins has proved the outstanding value of "Flexol" DOP.

In nitrocellulose and ethyl cellulose lacquers, "Flexol" DOP has durability as well as excellent heat and light stability, and efficient plasticizing action.

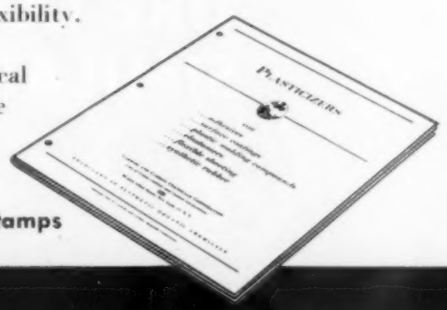
In synthetic rubber, "Flexol" DOP develops high tensile strength, resilience, and low-temperature flexibility. It has a neutral effect on cure.

Write for the booklet "Plasticizers." Our technical representatives will be glad to help you choose the plasticizer that will give you the properties you desire.

**OTHER PLASTICIZERS**

In addition to "Flexol" DOP, Carbide and Carbon Chemicals Corporation supplies a varied group of plasticizers designed to fit important industrial requirements. These include:

"Flexol" plasticizer 3GH
"Flexol" plasticizer 3GO
"Flexol" plasticizer 4GO
"Flexol" plasticizer 8N8
"Flexol" plasticizer CS-24
"Flexol" plasticizer TOF
Dimethyl Phthalate
Dibutyl Phthalate




**Buy and Hold United States Victory Bonds and Stamps**

SYNTHETIC ORGANIC CHEMICALS

**CARBIDE AND CARBON CHEMICALS CORPORATION**

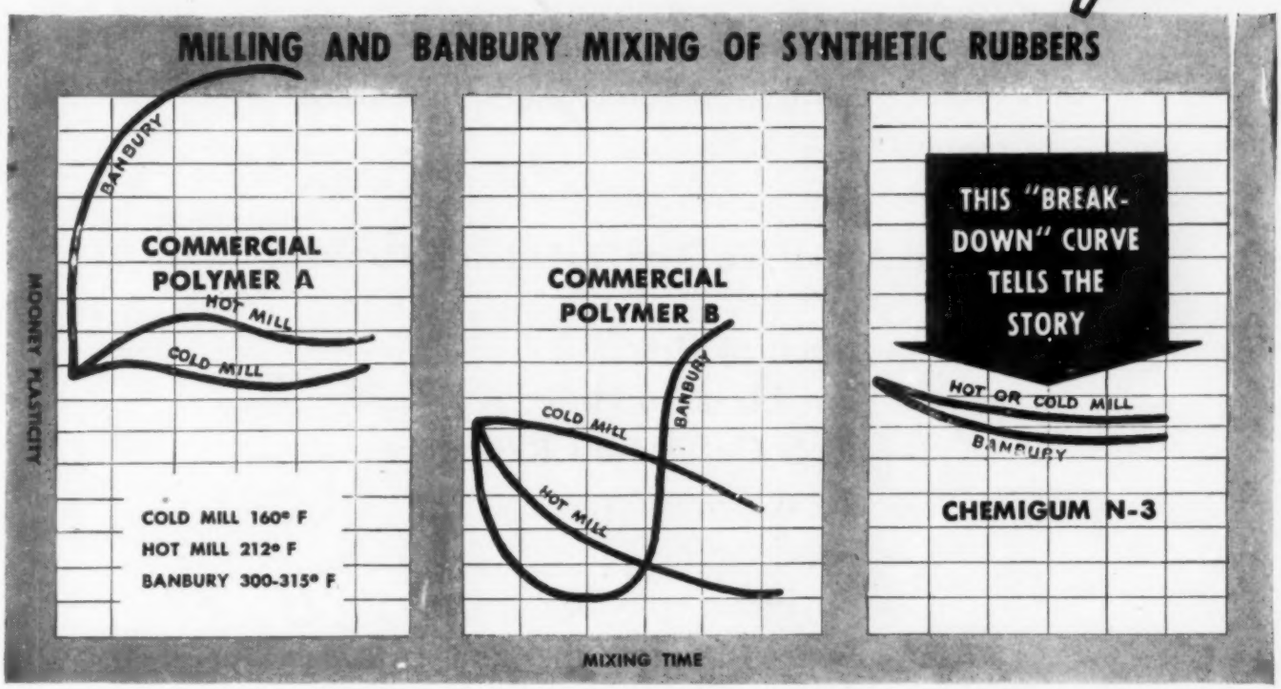
*Unit of Union Carbide and Carbon Corporation*

UCC

30 East 42nd Street, New York 17, N. Y.

"Flexol" is a registered trade-mark of Carbide and Carbon Chemicals Corporation.

# Here's Why CHEMIGUM N-3 handles easier




THE above chart tells you why Goodyear's new Chemigum N-3 is far more satisfactory to work with than other commercial polymers. It is *heat stable*—shows no hardening even when mixed at elevated temperatures for protracted periods.

Along with this greater uniformity, Chemigum N-3 is equally notable for its Low Compression Set, Low Solvent Swell and Good Heat-Aging Characteristics—qualities that eliminate many processing troubles, save time and insure higher quality in your final products.

Chemigum N-3 is recommended for all compounds that call for a Buna-N oil-resistant synthetic base. We can now fill orders in any volume. For sample and processing data, write: Goodyear Chemical Products Division, Plastics and Coatings Dept., Akron 16, Ohio.

Chemigum (pronounced Kem-e-gum)—
T.M. The Goodyear Tire & Rubber Company

**GOODYEAR**

**THE GREATEST NAME IN RUBBER**

A NEW RESIN–

# Polymel No. 6

*Strikingly Unique* *Low in Price*

By means of a recently developed process* a well-known viscous Asphalt is solidified without Oxidation or apparent Chemical Change.

Specially Adapted To Tire Tread and Carcass Stocks

– Excellent Processing
– Low Heat Build-up
– High Cut-growth Resistance
– Good Abrasion
– Good Aging
– No Effect on Cure
– Easy to Handle in Plant
– Unlimited Tonnage Available

A PERFECT PLASTICIZER FOR BLACK MILL-MIXED MECHANICAL GOODS STOCKS

*May we send you Technical Data and Samples?*

**Patent applied for*

## THE CALDWELL COMPANY

2412 First Central Tower Akron 8, Ohio

Manufactured by the Polymel Corporation, Baltimore, Md.

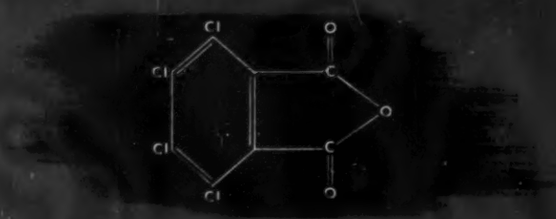
PRESENTING...

# Niathal

## TETRACHLORO PHTHALIC ANHYDRIDE

**A NEW AND VERSATILE INDUSTRIAL CHEMICAL For Which A Manufacturing Process Has Been Developed**

● NIATHAL* is fully chlorinated Phthalic Anhydride—all four hydrogen atoms being replaced by chlorine. The molecular structure of Tetrachloro Phthalic Anhydride may be represented as follows: The molecular weight of this compound is 285.9 and the chlorine content is 49.6%. It is made by a novel process for which patent protection is pending.




**PROPERTIES**—NIATHAL is an almost white, odorless powder. Its purity is greater than 99%, the remainder being chiefly chemically bound water. It is free-flowing and non-hygroscopic.

NIATHAL melts with very slight decomposition at 254-255°C (255°C = 491°F), as against 254.9°C for the 100% pure compound. It has an appreciable vapor pressure at elevated temperatures and particularly above its melting point. It boils at approximately 362°C (684°F).

Although our own experience indicates that NIATHAL is non-irritating and non-toxic, we recommend suitable precautions when using it for making new compounds and products.

**SOLUBILITY**—100 parts of water dissolves with difficulty up to 0.33 parts of NIATHAL at 20°C and about 1.6 parts at 90°C, forming the corresponding dibasic acid. A pH of about 2.0 characterizes this solution.

With caustic soda or caustic potash solutions NIATHAL readily forms the neutral alkali salts, both of which are highly soluble; about 35% aqueous solutions of these salts may be obtained at 65°C. These salts, as well as the slightly soluble acid salts, form crystalline solids. NIATHAL forms nearly insoluble salts of several common metals.

NIATHAL is soluble in several organic solvents. For example, 2 to 6% solutions may be obtained at room temperature in Acetone, Benzene, and Chlorobenzene. Solubilities materially increase with elevation of temperature.

**USES**—Since Phthalic Anhydride has found extensive use in numerous synthetic organic chemical industries, it is predicted that the chlorinated product will also find large and varied outlets. The introduction of almost 50% chlorine into the molecule yields new and interesting properties. The chemical structure is highly stable. This fact, in combination with high melting point, suggests that compounds made from NIATHAL may be used at more elevated temperatures. High chlorine content also improves resistance to fire.

NIATHAL is suggested for use as an intermediate or compounding material in the manufacture of . . .

DYES • ESTERS • SYNTHETIC RUBBERS
PHARMACEUTICALS • PLASTICIZERS • INSULATING MATERIALS • FUNGICIDES • PROTECTIVE COATINGS • LUBRICANTS • SYNTHETIC RESINS.

**SHIPPING CONTAINERS**—NIATHAL will be shipped in fiber containers or paper-lined wooden barrels of various sizes. It is at present available only in experimental amounts. Sample on request.

# Niagara ALKALI COMPANY

"An Essential Part Of America's Great Chemical Enterprise"

60 EAST 42nd STREET, NEW YORK 17, N. Y.

CAUSTIC POTASH • CAUSTIC SODA • PARADICHLOROBENZENE • CARBONATE OF POTASH • LIQUID CHLORINE

*Trade Mark Registration applied for

*A promise that can be taken for granted*

The end of the war means the end of an unparalleled military effort by the American people. Their profound sense of relief at the removal of a burden of unequalled magnitude in history will now find release in a desire for the many material comforts which, of necessity, was denied to all during the war.

The rubber, paint and other industries consuming zinc oxides are now confronted with an enormous pent-up demand for their respective products. But, as usual, these industries—always distinguished for their enterprise—will "come through" for the consumer. And, with equal certainty, the St. Joseph Lead Company will, as usual, be ready to supply its customers with the pigments they have always preferred—ST. JOE Lead—Free ZINC OXIDES

ST. JOSEPH LEAD COMPANY

250 PARK AVE., NEW YORK 17, N. Y.

*MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES*

MONSANTO CHEMICALS

*You are invited to profit by our experience*

R. S. V. P.

Through its Rubber Service Laboratories at Akron, Monsanto offers you the full advantage of its war-learned knowledge, backed up by twenty-five years of experience in developing and proving rubber chemicals.

The benefit of this practical experience with natural and synthetic rubber is yours for the asking and without obligation. Please write: MONSANTO CHEMICAL COMPANY, Rubber Service Department, Second National Building, Akron 8, Ohio.

**MONSANTO CHEMICALS** ***Serving the Rubber Industry:***

Accelerators, Antioxidants, colors, plasticizers, "Insoluble Sulfur 60," wetting agents.

*Photo Courtesy Ewing Galloway*

# PELLETEX for PEACE

After showing you many "action shots" of PELLETEX at war, it is with gratitude that we now show the above scene of peace and suggest that we can again be of service in supplying America's leading semi-reinforcing furnace black for peacetime products.

Both PELLETEX and GASTEX are now released in any quantity for any use.

**GENERAL ATLAS CARBON CO.**

PELLETEX

GASTEX

**MANUFACTURER**

**Pampa, Texas**

**Guymon, Okla.**

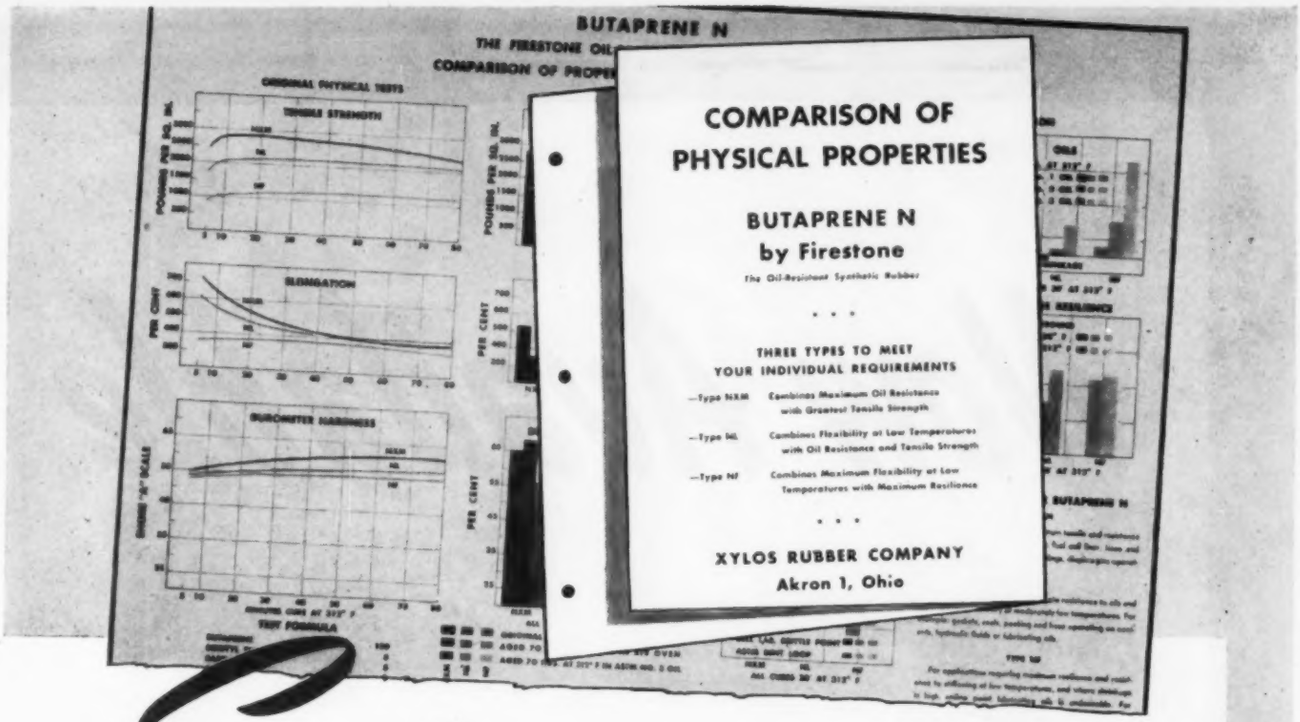
**HERRON BROS. and MEYER**

**DISTRIBUTOR**

**New York, N. Y.**

**Akron, Ohio**

RUBBER H AND M PIGMENTS Chemicals


BUTAPRENE N
COMPARISON OF PHYSICAL PROPERTIES
BUTAPRENE N
by Firestone
The Oil-Resistant Synthetic Rubber
THREE TYPES TO MEET YOUR INDIVIDUAL REQUIREMENTS
—Type NXM Combines Maximum Oil Resistance with Greatest Tensile Strength
—Type ML Combines Flexibility at Low Temperatures with Oil Resistance and Tensile Strength
—Type NF Combines Maximum Flexibility at Low Temperatures with Maximum Resilience
XYLOS RUBBER COMPANY
Akron 1, Ohio

# *See for yourself—*

# WHAT BUTAPRENE N WILL DO FOR YOU

THE way these Butaprene-N synthetic rubbers perform under almost *impossible* conditions is little short of *remarkable*. So to guard against overstatement in our enthusiasm we have set down a few graphs and columns to show you in a cold, calculating, *scientific* way just what Butaprene-N will do for you. Tensile strength, elongation, cold resistance, resilience, resistance to oils and fuels — all are pictured in a sizable chart (11″ x 16″, in three colors) that shows at a glance the amazing physical properties of these *versatile* Firestone synthetic rubbers.

We'll gladly send you one of these charts — without obligation of course. And we'll do even more. If you wish, we'll have a member of the Butaprene technical staff *personally* go over your rubber problems with you. Simply write XYLOS RUBBER COMPANY, Akron 1, Ohio.

## BUTAPRENE N *by* Firestone

**THE SYNTHETIC RUBBER OF A THOUSAND USES**

*RESISTS: Oil - - Gasoline - - Heat - - Sub-Zero Cold - - Aging - - Abrasion*

Copyright, 1945, The Firestone Tire & Rubber Co.

*Now Available.....*

# GOODRITE ERIE

**an outstanding accelerator for low heat build-up in compounding GR-S and natural rubber**

# VULTROL

for use in synthetic rubber compounding to prevent scorching, and for recovering scorched stocks

*For technical data please write*

**B. F. Goodrich Chemical Company**

A DIVISION OF THE B. F. GOODRICH COMPANY

ROSE BUILDING CLEVELAND 15, OHIO

**Technical Bulletin No. 15** — on the Compounding of GR-S with Substantial Loadings of Zinc Oxide

# Effect of Moisture on Zinc Oxide—GR-S Compounds

(Refer to Technical Bulletin No. 12)

**ORIGINAL RESULTS**

| Time of Cure Min. at 45 Lb. | Tensile Strength (psi) | Per Cent Elongation | Modulus-Load (psi) for Elongation of: 200% | 300% | 400% | 500% | Shore Hardness | Permanent Set |
|---|---|---|---|---|---|---|---|---|
| **NO WATER—XX RED-4** | | | | | | | | |
| 15 | 1240 | 1005 | 80 | 115 | 155 | 195 | 45 | .42 |
| 30 | 1230 | 780 | 155 | 190 | 230 | 345 | 47 | .30 |
| 45 | 1115 | 685 | 155 | 190 | 270 | 425 | 48 | .25 |
| 60 | 1165 | 660 | 155 | 235 | 310 | 465 | 48 | .26 |
| 90 | 1040 | 630 | 190 | 230 | 345 | 540 | 49 | .24 |
| 120 | 1050 | 630 | 195 | 235 | 350 | 545 | 49 | .24 |
| **NO WATER—XX RED-166** | | | | | | | | |
| 15 | 1205 | 1060 | 115 | 150 | 190 | 225 | 44 | .48 |
| 30 | 1600 | 880 | 150 | 190 | 230 | 340 | 45 | .36 |
| 45 | 1530 | 780 | 155 | 235 | 275 | 430 | 47 | .34 |
| 60 | 1320 | 710 | 195 | 235 | 350 | 465 | 49 | .29 |
| 90 | 1410 | 680 | 235 | 275 | 350 | 550 | 49 | .29 |
| 120 | 1115 | 630 | 230 | 270 | 385 | 575 | 49 | .23 |
| **5% WATER ON THE POLYMER—XX RED-4** | | | | | | | | |
| 15 | 1370 | 735 | 185 | 260 | 335 | 480 | 53 | .59 |
| 30 | 1280 | 640 | 235 | 310 | 425 | 700 | 53 | .53 |
| 45 | 1450 | 630 | 230 | 340 | 495 | 840 | 52 | .56 |
| 60 | 1470 | 610 | 225 | 300 | 490 | 830 | 52 | .47 |
| 90 | 1640 | 620 | 230 | 340 | 535 | 915 | 53 | .49 |
| 120 | 1115 | 540 | 270 | 385 | 575 | 960 | 53 | .36 |
| **5% WATER ON THE POLYMER—XX RED-166** | | | | | | | | |
| 15 | 1440 | 730 | 215 | 290 | 395 | 540 | 53 | .62 |
| 30 | 1500 | 660 | 225 | 335 | 525 | 785 | 53 | .50 |
| 45 | 1560 | 630 | 265 | 380 | 570 | 915 | 53 | .60 |
| 60 | 1630 | 635 | 270 | 350 | 545 | 890 | 53 | .57 |
| 90 | 1610 | 620 | 300 | 410 | 600 | 975 | 53 | .54 |
| 120 | 1550 | 590 | 300 | 415 | 605 | 1020 | 53 | .44 |

| | Time of Cure Min. at 45 Lb. | Shore Hardness Pendulum Block | Goodyear-Healey Pendulum: Indentation in mm. | Goodyear-Healey Pendulum: Per Cent Rebound | Compression Fatigue (Goodrich Flexometer)*: Per Cent Initial Comp. | Compression Fatigue (Goodrich Flexometer)*: Running Time and Per Cent Permanent Set | Compression Fatigue (Goodrich Flexometer)*: Max. Temp. Rise °C. | Compression Fatigue (Goodrich Flexometer)*: Dynamic Compression: Initial | Compression Fatigue (Goodrich Flexometer)*: Dynamic Compression: Final | Cut-Growth Resistance: Tested at 70°C. Inches Failure: 2,000 Cyc. |
|---|---|---|---|---|---|---|---|---|---|---|
| **XX Red-4** | | | | | | | | | | |
| No Water | 90 | 48 | 7.73 | 57.4 | 22.2 | †B.O.-10' | 69.6 | 8.7 | 24.6 | .69 |
| 5% Water | 90 | 50 | 7.43 | 58.6 | 20.3 | 15'-24.3 | 75.5 | 6.4 | 24.2 | .31 |
| **XX Red-166** | | | | | | | | | | |
| No Water | 90 | 48 | 7.73 | 56.6 | 21.8 | 20'-31.1 | 94.6 | 8.7 | 31.3 | .40 |
| 5% Water | 90 | 52 | 7.20 | 58.3 | 18.0 | 10'-16.0 | 57.7 | 3.8 | 16.3 | .21 |

* Test Conditions: 93 psi load. 0.25" stroke. 100° C. oven temp. †Blew Out.

NOTE: Goodrich Flexometer test conditions have been made more severe for stocks of 50 Shore "A" Durometer or under. This should be taken into consideration when making comparisons with previous work where the operating conditions were: 100 lb. load, 0.15" stroke, 100° C. Oven Temp.

*Uniform Quality*
**HORSE HEAD ZINC OXIDES**

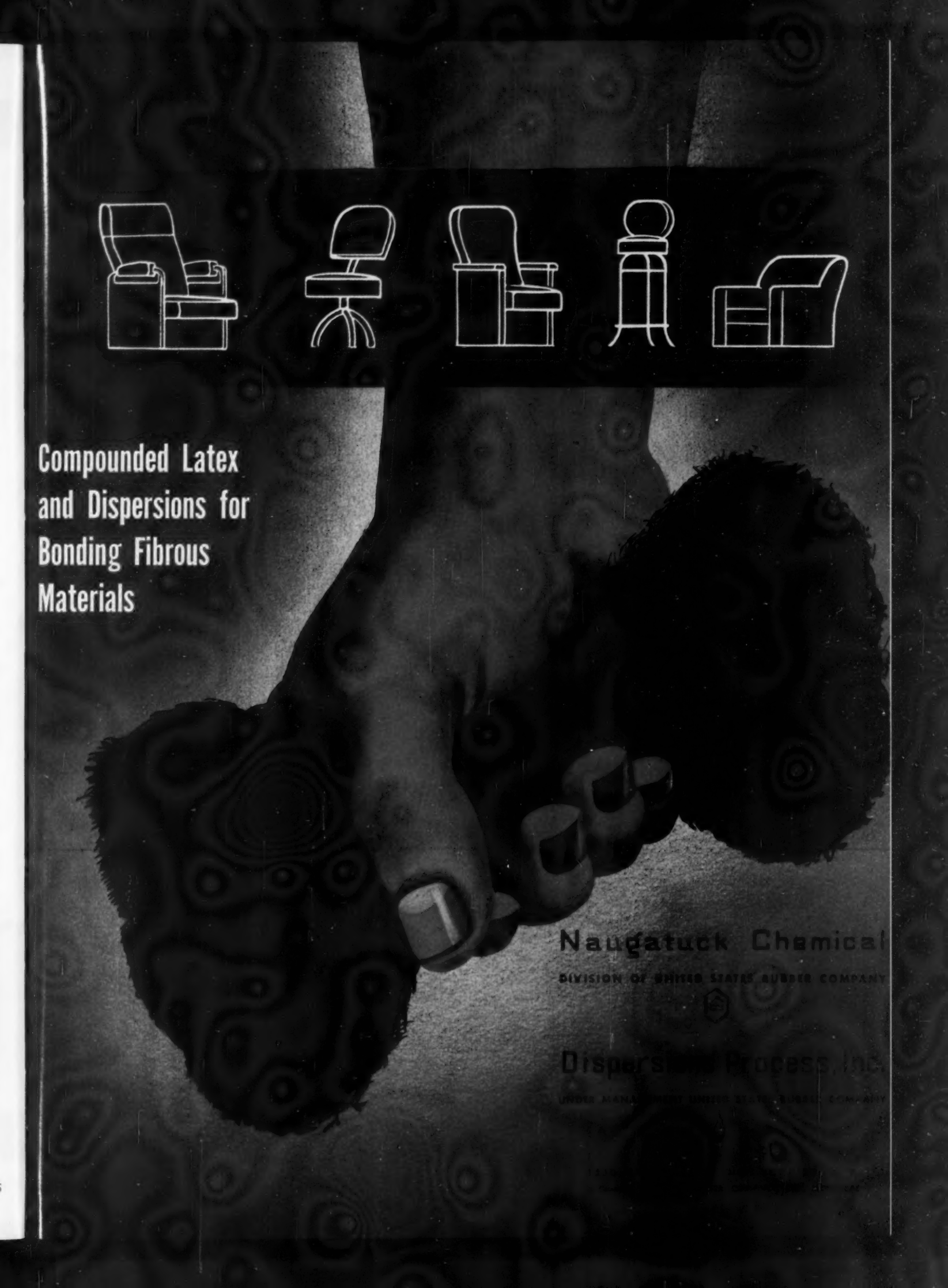
New Jersey Zinc

TECHNICAL BULLETIN No. 12 featured the effect of the addition of moisture to a GR-S compound containing a 100 part loading of Kadox-15 zinc oxide. The study is continued with the same loading of the XX Red-4 and XX Red-166 brands. Tensile, modulus and tear values are increased by the water addition. Permanent set is increased as was the case with Kadox-15 but, in spite of this, pendulum rebound and cut-growth are improved. Heat generation is satisfactory under the new severe operating conditions.

**COMPOUND No. 15**

| | |
|---|---|
| GR-S | 100.0 |
| Sulfur | 3.5 |
| MBT | 2.0 |
| Coumarone-indene resin | 7.5 |
| E.L.C. Magnesia | 5.0 |
| Zinc Oxide | 100.0 |
| Water | variable |

**THE NEW JERSEY ZINC COMPANY**
**160 FRONT STREET • NEW YORK 7, N. Y.**


Compounded Latex
and Dispersions for
Bonding Fibrous
Materials
Naugatuck Chemical
DIVISION OF UNITED STATES RUBBER COMPANY

# FOR UNIFORMITY AND PURITY

## IN CHEMICALS FOR THE NEW RUBBERS

***SELECT THESE GENERAL CHEMICAL PRODUCTS FOR YOUR REQUIREMENTS:***

BASIC CHEMICALS

GENERAL CHEMICAL COMPANY

FOR AMERICAN INDUSTRY

**Sulfuric Acid:** All grades and strengths.

**Aluminum Sulfate:** To precipitate polymerized synthetic rubbers.

**Fluosulfonic Acid:** For production of Boron Trifluoride.

**Potassium Cyanide—Sodium Cyanide:** In production of acrylonitrile rubbers.

**Sulfur:** Commercial Rubbermakers' and other grades.

**Copper Fluoborate—Zinc Fluoborate—Copper Cyanide—Sodium Cyanide:** Intermediates for "plating" rubber to metals.

**Lead Fluoborate:** For lead plating in battery manufacture.

*Baker & Adamson Reagents and Fine Chemicals*

**GENERAL CHEMICAL COMPANY**

**40 RECTOR STREET, NEW YORK 6, N. Y.**

*Sales and Technical Service Offices:* Atlanta • Baltimore • Boston • Bridgeport (Conn.) Buffalo • Charlotte (N. C.) • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City • Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence (R. I.) San Francisco • Seattle • St. Louis • Utica (N. Y.) • Wenatchee • Yakima (Wash.)

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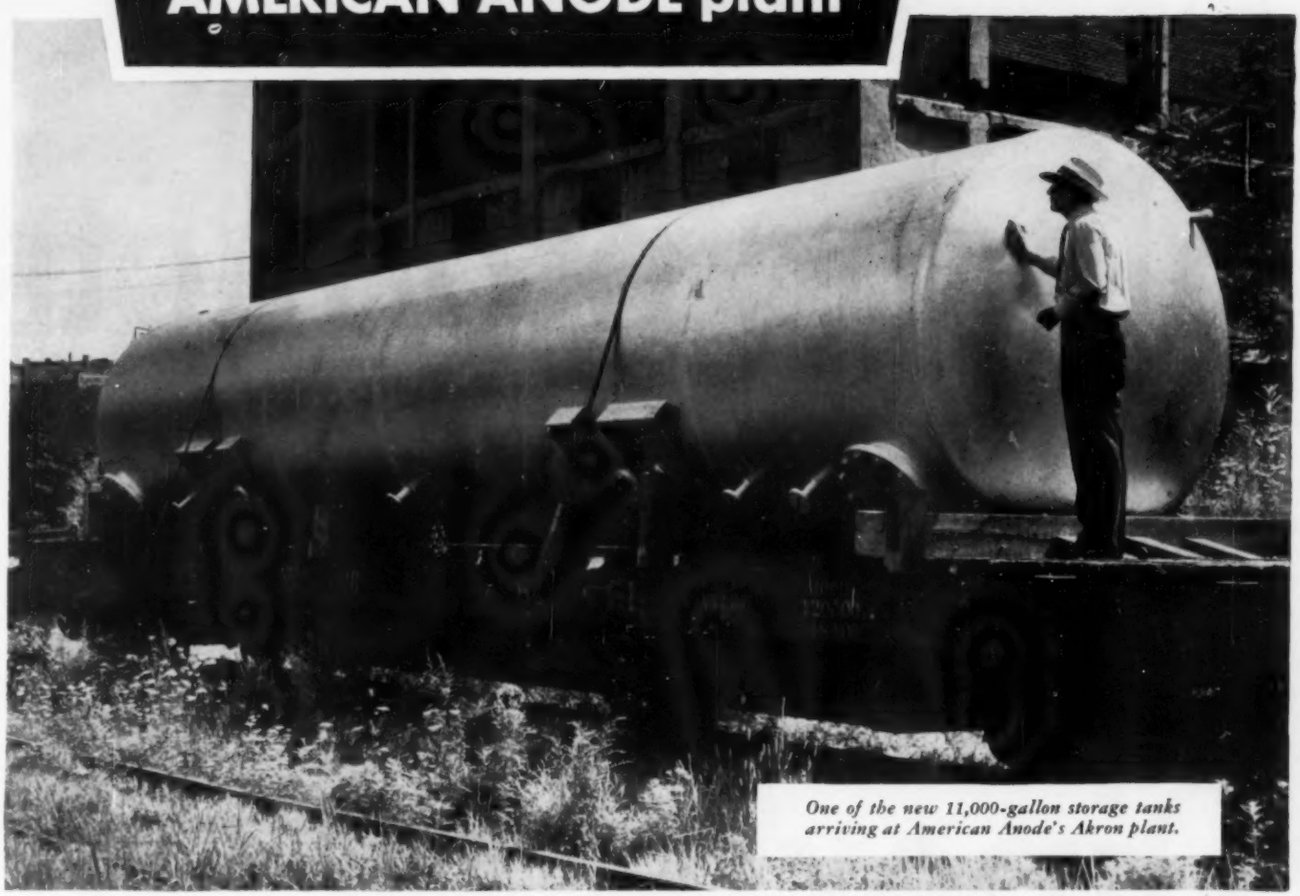
# NOW...
# Bulking facilities for all type latices at AMERICAN ANODE plant



*One of the new 11,000-gallon storage tanks arriving at American Anode's Akron plant.*

## *Large volume requirements can be handled quickly . . . safely*

Additional advantages of American Anode's new bulk storage facilities are:

1. Positive uniformity of quality . . . an entire shipment made from one lot of latex . . . better winter protection . . . insured maintenance of pH.
2. *All* types latices immediately available . . . natural rubber, GR-S, Hycar, Geon, Neoprene . . . enable us to give you exactly what you need for your finished product.
3. Better service . . . due to reduced time lag in filling orders.

Add to these the processing, economy, and safety advantages of using American Anode water dispersions for coating, impregnating, and cementing . . . add the experience with these materials that American Anode has gained over a period of many years' pioneering . . . then let our research staff work with you to determine how you can most effectively use this new service. For more information please write American Anode, Inc., 60 Cherry Street, Akron, Ohio.

AMERICAN ANODE
INCORPORATED
NATURAL AND SYNTHETIC RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS

# Makers of plastic products approve Dipex*

DEVELOPED to serve a wider range of usefulness for manufacturers, DIPEX is a high quality anti-sticking agent. It can be advantageously used to mold rubber, reclaimed and synthetic rubber, resins and asphalts. It is freely soluble in water and can be applied to dilute solution by spraying, brushing or dipping. Because DIPEX is extremely light in color, it can be applied to molds for white goods to give clean, sharp designs.

*Free samples available on request, together with full technical data.*

*Reg. U. S. Pat. Off.

**Stanco Incorporated**

**216 WEST 14TH STREET, NEW YORK 11, N. Y.**

Copr. 1945, Stanco Incorporated

# CHECK THESE 2 ✻ PERFORMANCE PROVED CEMENTS AGAINST YOUR NEEDS!

## N-100 SELF-CURING ADHESIVE ✻

*for cementing together or one to another* raw fabrics, coated fabrics, molded parts, leather, wood, paper, tubing, sponge, channel-stock, stripping and sheet material . . . *as a Sealant* for rubber and synthetic valve seats, gaskets, etc.

***A Two-Part Neoprene Base Formula of Brush Viscosity and Neutral in Color***

. . . Extremely high green strength . . . Good strength after standing 3 to 4 hours . . . Optimum cure reached in 10 days at 68-70° F (in 16 hours at 100-125° F; in 1 hour at 255-260° F) . . . Excellent water, oil, flame and delamination resistance . . . Chemical resistance to acetic acid, alcohols, aliphatic hydrocarbons, ammonia, calcium chloride, copper sulphate, fatty acids, hydrochloric acid, oxalic acid, phenol, sodium hydroxide, sulfuric acid . . . Extremely high shear strength . . . Contains no Benzol.

## N-800 NEOPRENE PUTTY ✻

*for Filling* rubber, neoprene and other synthetic rubber parts . . . *for Repairing* wire cable . . . *as a Binder . . . and for Caulking.*

***A Two-Part Neoprene Base Formula of Putty Consistency and Black in Color***

. . . Bonds without Primers . . . Optimum cure reached in 10 days at 68-70° F (in 16 hours at 100-125° F; in 1 hour at 255-260° F) . . . High dielectric strength . . . Excellent water, oil and flame resistance . . . Chemical resistance to acetic acid, alcohols, aliphatic hydrocarbons, ammonia, calcium chloride, copper sulphate, fatty acids, hydrochloric acid, oxalic acid, phenol, sodium hydroxide, sulfuric acid.

✻ Both of these formulas have been *performance-proved* in important war production work over a period of several years.

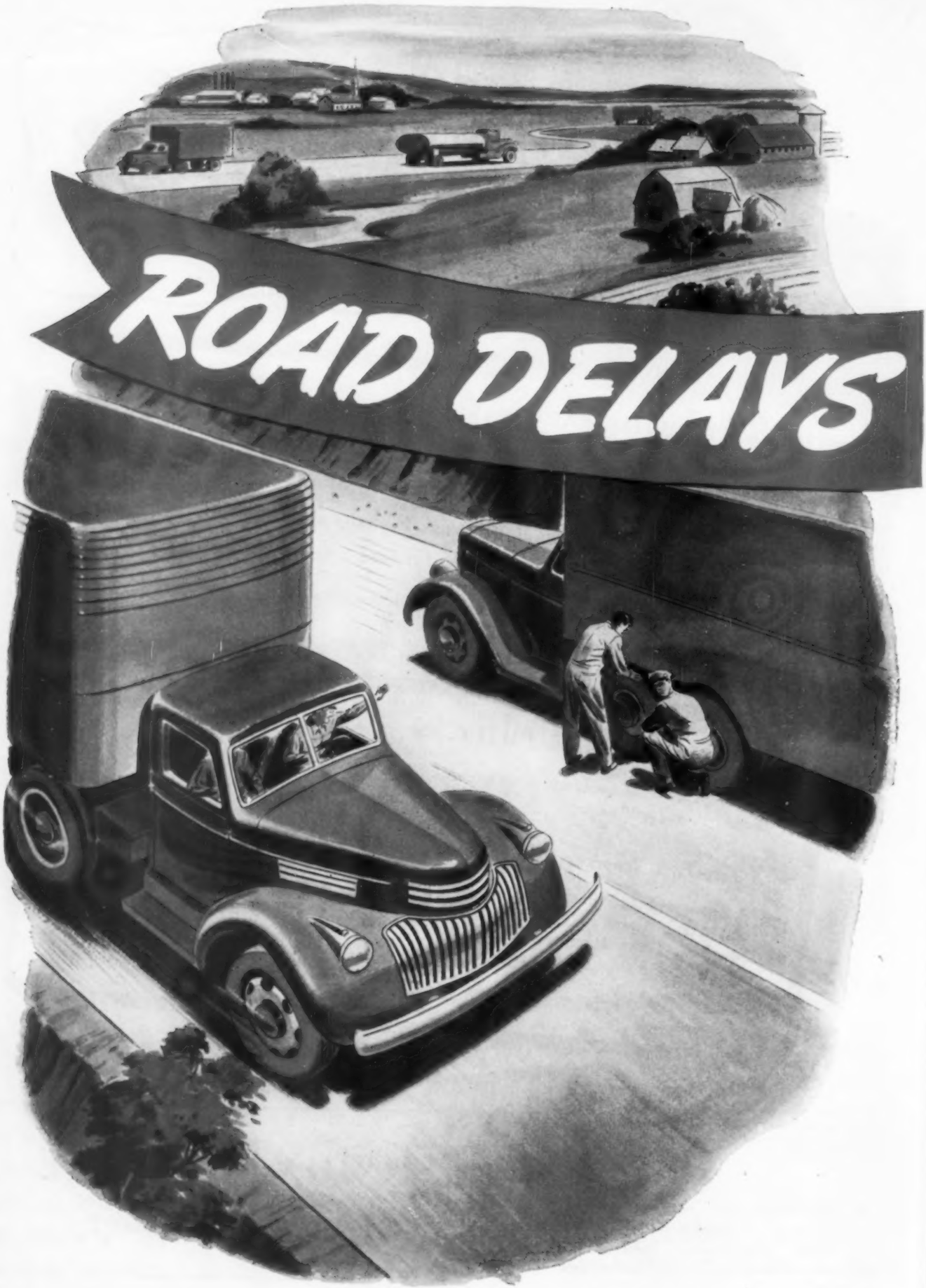
*Address all inquires to the Union Bay State Chemical Company, Rubber Chemicals Division, 50 Harvard St., Cambridge 42, Massachusetts.*

UBS

UNION BAY STATE
*Chemical Company*

*Serving Industry with Creative Chemistry*

ORGANIC CHEMICALS · SYNTHETIC LATEX · SYNTHETIC RUBBER
PLASTICS · INDUSTRIAL ADHESIVES · DISPERSIONS
COATING COMPOUNDS · IMPREGNATING MATERIALS · COMBINING CEMENTS


ROAD DELAYS

RAYON-CORD tires have hung up a notable record of achievement in world-wide military service in every climate. This success was clearly forecast by exhaustive Army proving-ground tests showing:

Rayon-cord synthetic rubber tires on long-distance supply work averaged 330% better.

Rayon-cord synthetic rubber tires on rough terrain averaged 93% better.

On the first test, heat and sustained operation were the problems. On the second, bruising and cutting. While these tests do not necessarily apply to other operating conditions, it is logical to conclude that your *road delays will be less* with rayon-cord tires for comparable commercial operation.

Road delays eat into your profits . . . often the profits of your customers, too. The lower operating temperatures possible with rayon-cord tires reduce blowouts, bruises and wear. And you'll find other benefits . . . fewer cuts, abrasions and sidewall breaks, better mileage and greater road safety.

*Source of data: Hearings before a Special Committee Investigating the National Defense Program, United States Senate—Seventy-eighth Congress, First and Second Sessions.*

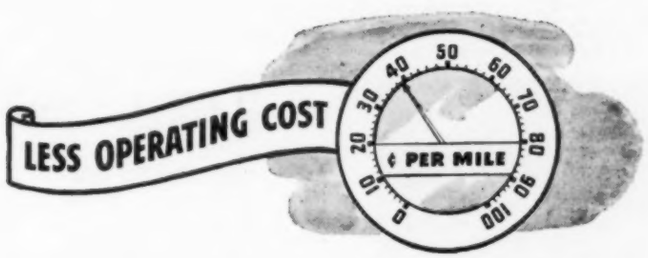
# Less with Rayon Cord

## "AFTER EXTENSIVE TESTS, GREYHOUND STARTED USING RAYON CORD TIRES IN 1937,"

*says* **W. A. DUVALL,** ***General Manager of Maintenance of The Greyhound Corporation***

"Based on our use of approximately 50,000 rayon tires annually, we know they have much better resistance to heat and impact breaks, minimizing front wheel blowouts. They'll haul higher loads more safely, too, because of their heat resisting qualities. Our records also show that we get better mileage on rayon."

Less friction heat, higher tensile strength and greater uniformity of rayon tire cords mean more safety at high running speeds.




Rayon-cord tires give longer life, greater mileage . . . reduce impact failures, road delays, tire renewals.

# AMERICAN VISCOSE CORPORATION

*America's largest producer of rayon tire cord, yarn and staple fiber*

*Offices:* 350 Fifth Avenue, New York 1, N. Y.; Charlotte, N. C.; Philadelphia, Pa.; Providence, R. I.; Washington, D. C., Wilmington, Del.

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**The guide of expert compounding for centuries**

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**The sign of expert service since 1868**

LOEWENTHAL and RUBBER have long been and are practically synonymous, particularly in the field of scrap rubber where we have provided expert and dependable service to reclaimers since the start of their business.

LET US SERVE YOU

# THE LOEWENTHAL CO.

JACK SIDER, *President* J. K. McELLIGOTT, *Exec. Vice-Pres.*

*We Solicit Your Inquiries*

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AKRON 5, OHIO

*Cable Address: "Gyblowell"*

# Firestone INSTALLS PC FOAMGLAS INSULATION

● In the new gum dip unit of the Firestone Tire and Rubber Company at Akron, Ohio, the drying room temperature will reach as high as 280°F. The ceiling, illustrated here, and also the walls and floor are insulated with PC Foamglas to insure that adjacent rooms be kept at normal temperature.




**THE DRYING ROOM** walls at the Firestone plant are insulated with two "dry sandwiches" of cement board and PC Foamglas. Note that the insulating blocks are laid dry, with broken joints, held in place by cement boards bolted to the steel frame. This shows how PC Foamglas becomes an integral part of the wall it insulates. General Contractor — Krumroy Construction Company, Akron, Ohio.

MORE and more plant managers are finding the answers to their insulating problems in the unique qualities of PC Foamglas.

On roofs and ceilings, in walls and floors, on tanks, towers and processing equipment, PC Foamglas has proved efficient in helping to control temperature, humidity and condensation—*permanently*.

For PC Foamglas is made of millions of air-filled glass cells. It is waterproof, fireproof, vaporproof, verminproof. It is impervious to humid atmospheres, to the fumes of most acids and to many other elements that impair — when they do not destroy—the insulating effectiveness of other materials. When you insulate with PC Foamglas, you insulate for keeps. First cost is last cost.

When you are figuring on insulation, it will pay you to find out why rubber manufacturers and many other satisfied users say they have found PC Foamglas the most efficient, the most economical insulating material.

You can get complete up-to-date information on PC Foamglas quickly and easily. Just check the convenient coupon, mail it to us and your selection of literature will be forwarded promptly. Room 811, Pittsburgh Corning Corporation, 632 Duquesne Way, Pittsburgh 22, Pa.

*Also makers of PC Glass Blocks*

**PC FOAMGLAS** *Waterproof Fireproof* **INSULATION**

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Room 811, 632 Duquesne Way
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Please send copies of the booklets checked below. It is understood that I incur no obligation.

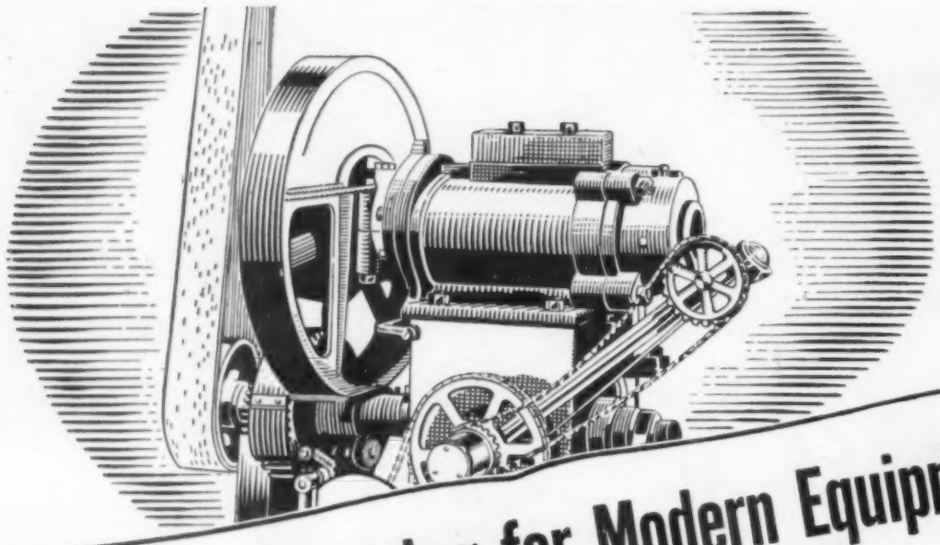
PC Foamglas Insulation

for Roofs.. for Walls.. for Floors..

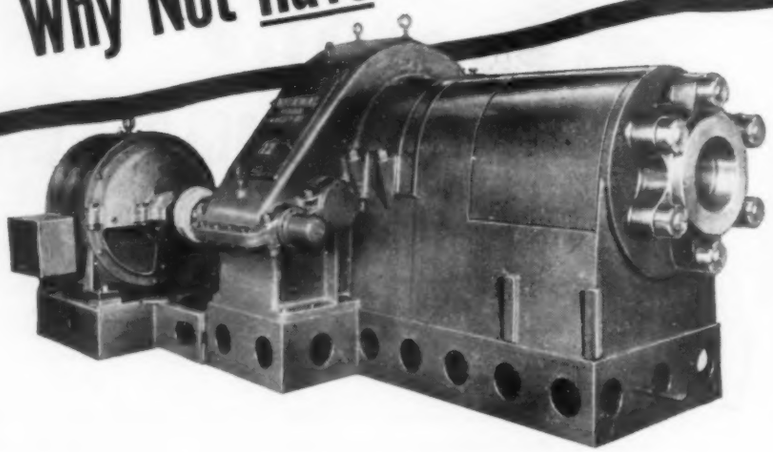
Name.....

Address.....

City..... State.....



# You're Paying for Modern Equipment! Why Not Have It?



IT is no economy to use antiquated rubber extruding equipment. Sluggish production, low efficiency, and high upkeep can add up within a few years to expenses greater than the cost of a new up-to-date National Extruder. Think of it! You may be laying out enough in *hidden costs* to more than pay for the modern equipment your business could so profitably use in the coming days of competitive selling.

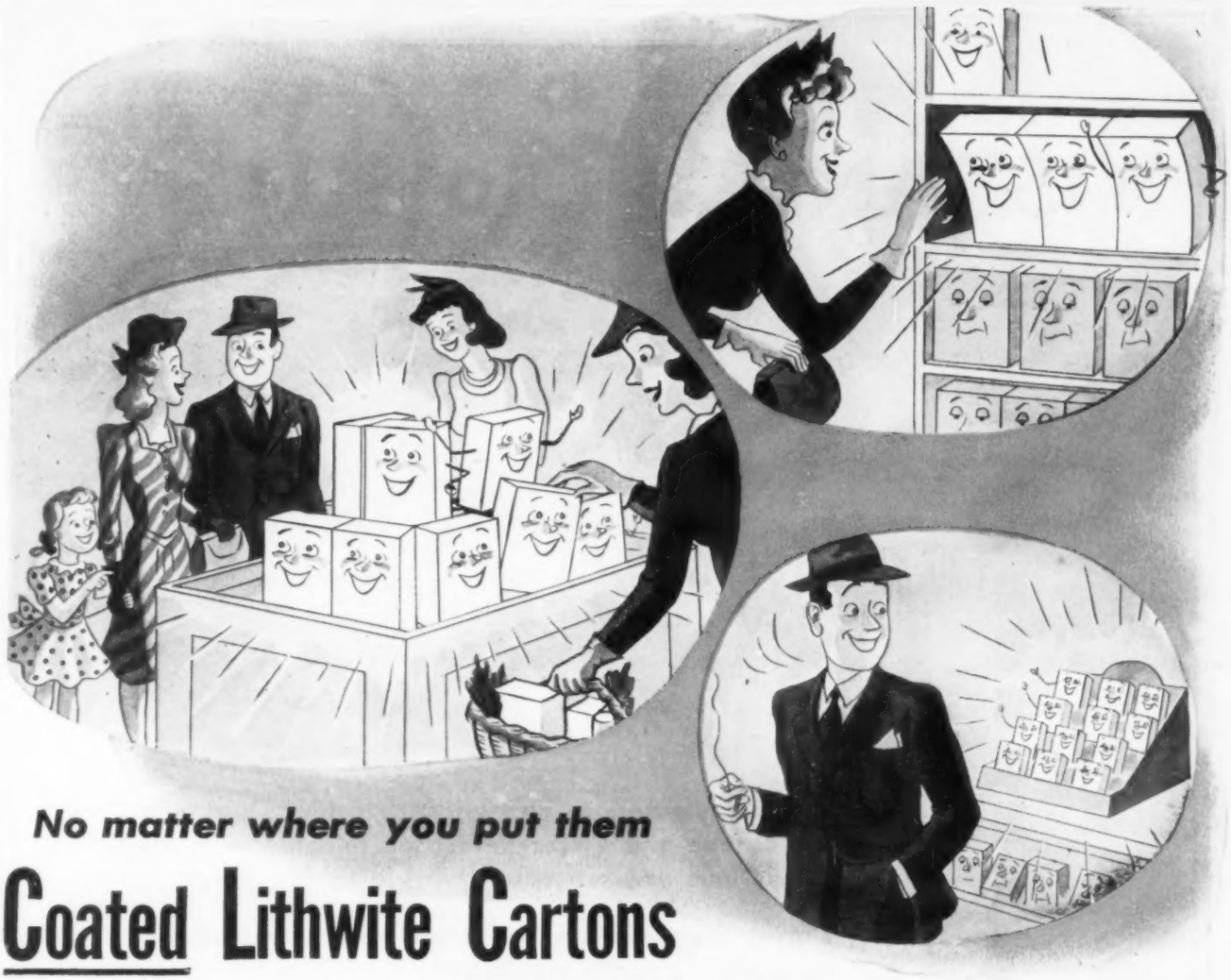
In scores of rubber plants, National Extruders are getting out the work *faster, cheaper,* and *better* than was even remotely possible with old, obsolete machines.

Whatever your requirements remember this: National Heavy Duty Extruders are designed for high production of today's new and different compounds . . . for flexibility, yet uniformly better quality.

In screw sizes from 2″ to 12″ and in special sizes and combinations, there's a National Extruder to meet *your* requirements. Let us show you what *up-to-date* equipment can do for you. Write National Rubber Machinery Company, 917 Sweitzer Ave., Akron 11, Ohio.

**NATIONAL RUBBER MACHINERY CO.**
General Offices: AKRON 11, OHIO

*Creative Engineering*



*No matter where you put them*

# Coated Lithwite Cartons

# SPEAK UP... AND SELL

**THEY HAVE THE EDGE ON THE OLD "SILENT SALESMAN" TYPE OF PACKAGE**

WHETHER YOUR PRODUCT is advertised, or not advertised, better display at the point of sale helps make *more* sales . . . and folding cartons of *Coated* Lithwite give products *outstanding* display. And why? Because this revolutionary, machine-coated paperboard makes pictures and colors more eloquent, gives voice to your sales story.

Smooth, velvety *Coated* Lithwite cartons have a quality look and feel. But more important, product pictures on these finer folding cartons stand out with a color brilliance and realism that implants a buying urge.

Deliveries . . . when? We wish we could say. But right now our carton plants are producing to capacity, and the backlog of orders is the greatest since we pioneered *Coated* Lithwite six years ago. Here's a suggestion: Get in touch with a Gardner-Richardson sales representative and discuss the matter of future delivery on *Coated* Lithwite cartons.

***Note These Outstanding Coated Lithwite Advantages***

**Made by a revolutionary process.** *Coated* Lithwite is the brighter, whiter paperboard that is formed, made and coated in one high-speed operation. Proved and improved for six years.

**Means more eye-appealing cartons.** *Coated* Lithwite has a smooth, rub-resistant, chalk-free surface. Forms a better base for printing inks and plates—reproduces even the smallest type cleanly, crisply. Brings colors up brilliantly—gives halftones a sharp realism.

**Fewer jammers and leakers.** *Coated* Lithwite scores without flaking or shattering. Takes a positive, tight seal.

**The GARDNER-RICHARDSON Co.**

**Manufacturers of Folding Cartons and Boxboard**

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Sales Representatives in Principal Cities: PHILADELPHIA · CLEVELAND · CHICAGO · ST. LOUIS · NEW YORK · BOSTON · PITTSBURGH · DETROIT

# VISTANEX POLYBUTENE
# VISTAC

*Now*
*Freely Available*

WE are pleased to announce that both Vistanex Polybutene and Vistac have been released from all restrictions and are now available to the industry.

During the war, these materials were only available for highest priority use, but can now be supplied for all purposes.

Vistanex Polybutene and Vistac, being substantially colorless, non-oxidizing, non-vulcanizing hydrocarbons, we particularly recommend these products for pressure sensitive adhesives, adhesive cements and in rubber compounding for superior aging and heat resistance.

Our laboratory will be glad to cooperate with you on your technical problems and supply you with all required data and information.

## ADVANCE SOLVENTS & CHEMICAL CORP.

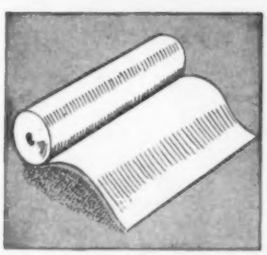
245 Fifth Avenue New York 16, N. Y.

# DIOCTYL SEBACATE

## A NEW ESTER TYPE PLASTICIZER

*provides*

**Efficiency, Permanence and Outstanding Flexibility at Low Temperatures In Polyvinyl Chloride Compounds**



Paper Coating

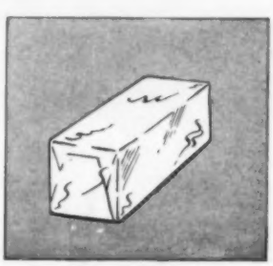
Wire and Cable Insulation

This new ester type plasticizer possesses a unique combination of properties which make it especially efficient in many applications of polyvinyl chloride compounds and their copolymers. Among these properties are excellent low temperature flexibility, good draping characteristics, good resistance to volatilization and extraction by water, and stability at elevated temperatures.

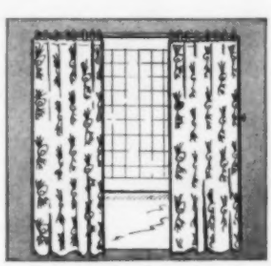
Coated fabrics that must withstand conditions of extreme temperatures; others which must resist water; strip coatings, free films, and wire and cable insulation...all gain advantage in manufacture—and performance—when Dioctyl Sebacate is used.

Our technical staff will aid you in the application of Dioctyl Sebacate to your special processes.

Rainwear



Film and Foil



Shower Curtains

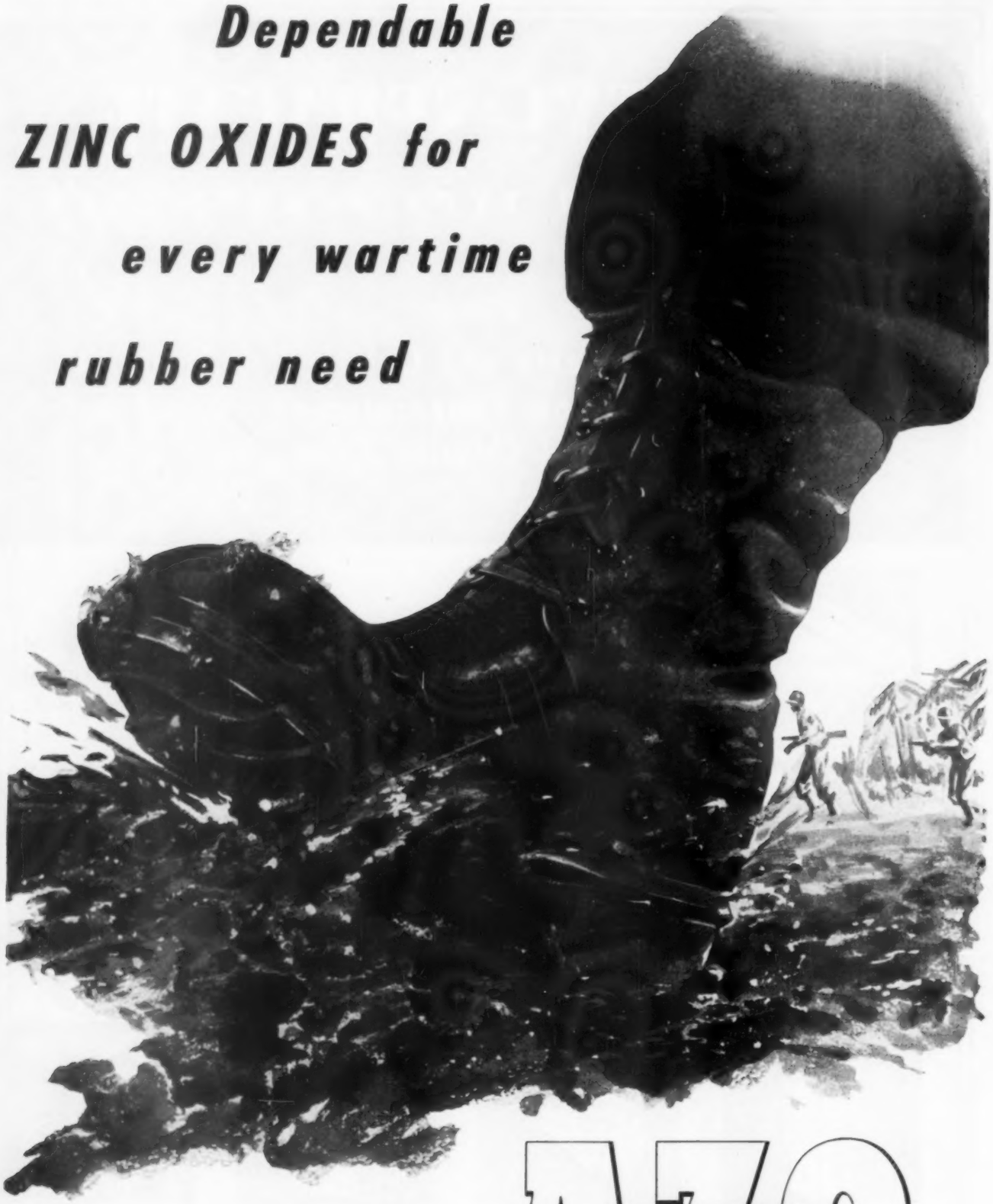
Strip Coatings

THE RUBBER CHEMICALS DEPARTMENT

# THE RESINOUS PRODUCTS & CHEMICAL COMPANY

*WASHINGTON SQUARE, PHILADELPHIA 5, PA.*

# *Dependable ZINC OXIDES for every wartime rubber need*



**AZO**
**ZINC OXIDES**

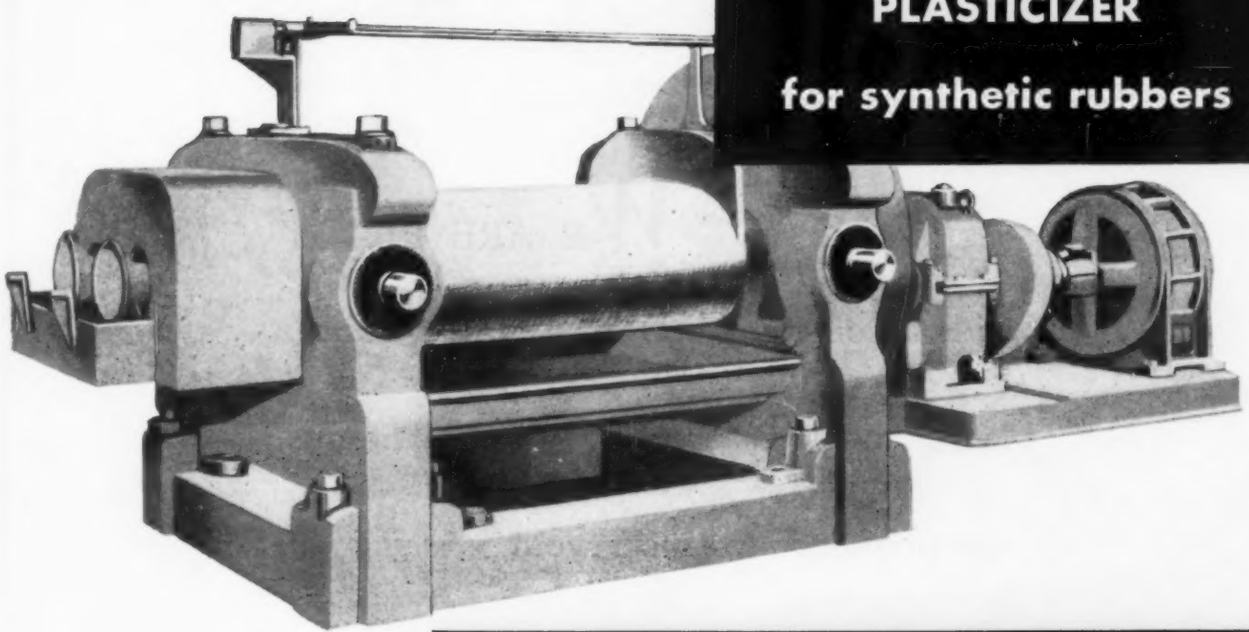
**AMERICAN ZINC SALES CO., Distributors for AMERICAN ZINC, LEAD & SMELTING CO.**
COLUMBUS, OHIO - CHICAGO - ST. LOUIS - NEW YORK

WORLD'S LARGEST PRODUCER OF SYNTHETIC RESINS

RCI

## answering your demand

## for a trustworthy PLASTICIZER for synthetic rubbers



## RCI Controlled-Quality

# DIBUTYL PHTHALATE

RCI has resumed quantity production of the proved plasticizer for Vinyl, Neoprene and Buna N types of synthetic rubber—dibutyl phthalate. And with the return of this basic chemical to RCI's Line of Raw Materials comes reassurance of uniformity from batch to batch because RCI's system of control guarantees constant quality. Meeting Army Specification 50-11-61A and Army-Navy Specification AN-O-D-361, RCI Dibutyl Phthalate is thoroughly dependable. For further information write direct to the Sales Department.

ARMY E NAVY

## REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

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**SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS**

*Announcement*

TO THE

# AUTOMOBILE INDUSTRY

WE ARE READY

with a complete line of synthetic rubber latex adhesives, coatings and saturants, compounded to meet your specific requirements.

## General Latex & Chemical Corp.

666 MAIN STREET • CAMBRIDGE, MASS.

Vultex Division — Verdun Industrial Buildings
River St., Verdun, Montreal, Quebec

Agents for Rubber Reserve Company for storage and distribution of natural rubber latex. Distributors for Rubber Reserve Company for synthetic latex. Operators of the Government-owned Baytown, Texas, synthetic rubber plant in collaboration with the General Tire & Rubber Co.

# Do you have 2.6 Children?

A ready-made coating . . . like a ready-made suit, is designed for Mr. Average, that mythical man who has 2.6 children. Therefore, when you buy a coating or suit, it either must be altered to fit your individual need, which is not always possible, or it always lacks some of the qualities that you need and want.

SYNTRON is a custom-made coating . . . made to fit your individual needs . . . with all the properties that are necessary to give you a perfect coating for your product. The Gordon-Lacey research laboratories are engaged exclusively in developing new and better coatings for fabrics and other surfaces.

Send us the story of your coating problem. Write for full information.

## Syntron Baby Pants Coating

**One of our many Custom-Made Products**

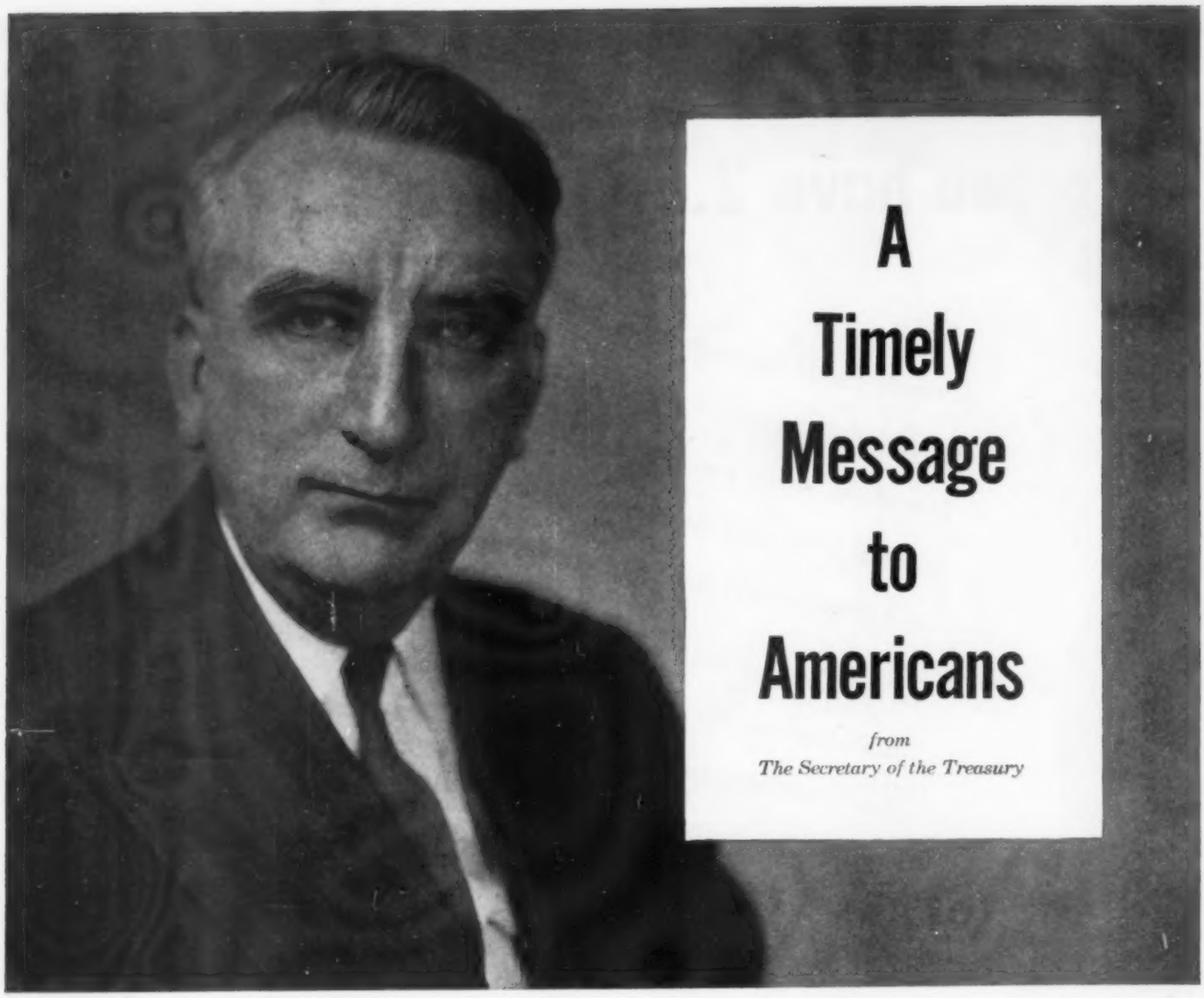
Developed especially for the manufacturer of coated fabrics for baby pants, combining the following characteristics:

- ★ 100% WATERPROOF
- ★ BOILPROOF . . . will not blister in boiling water
- ★ SOFT and FLEXIBLE
- ★ ABRASION-RESISTANT . . . will not scuff or peel
- ★ ACID and ALKALI RESISTANT
- ★ OIL and GREASE RESISTANT

SYNTRON* Coatings for PAPER CLOTH METAL

*TRADE MARK

**GORDON-LACEY**
**Chemical Products Co.**
57-02 48th ST. • MASPETH, N. Y.



# A Timely Message to Americans

*from*
*The Secretary of the Treasury*

**America has much to be thankful for.**

Abroad we have overcome enemies whose strength not long ago sent a shudder of fear throughout the world.

At home we have checked an enemy that would have impaired our economy and our American way of life. That enemy was inflation—runaway prices.

The credit for this achievement, like the credit for military victory, belongs to the people.

You—the individual American citizen—have kept our economy strong in the face of the greatest inflationary threat this nation ever faced.

You did it by simple, everyday acts of good citizenship.

You put, on the average, nearly one-fourth of your income into War Bonds and other savings. The 85,000,000 owners of War Bonds not only helped pay the costs of war, but also contributed greatly to a stable, prosperous postwar nation.

You, the individual American citizen, also helped by cooperation with rationing, price and wage controls, by exercising restraint in your buying and by accepting high wartime taxes.

All those things relieved the pressure on prices.

**THE TASK AHEAD**

We now set our faces toward this future: a prosperous, stable postwar America—an America with jobs and an opportunity for all.

To achieve this we must steer a firm course between an inflationary price rise such as followed World War I and a deflation that might mean prolonged unemployment. Prices rose more sharply after the last war than they did during the conflict and paved the way for the depression that followed—a depression which meant unemployment, business failures and farm foreclosures for many.

Today *you* can help steer our course toward a prosperous America:

—by buying all the Victory Bonds you can afford *and by holding on to the War Bonds you now have*

—by cooperating with such price, rationing and other controls as may be necessary for a while longer

—by continuing to exercise patience and good sense with high faith in our future.

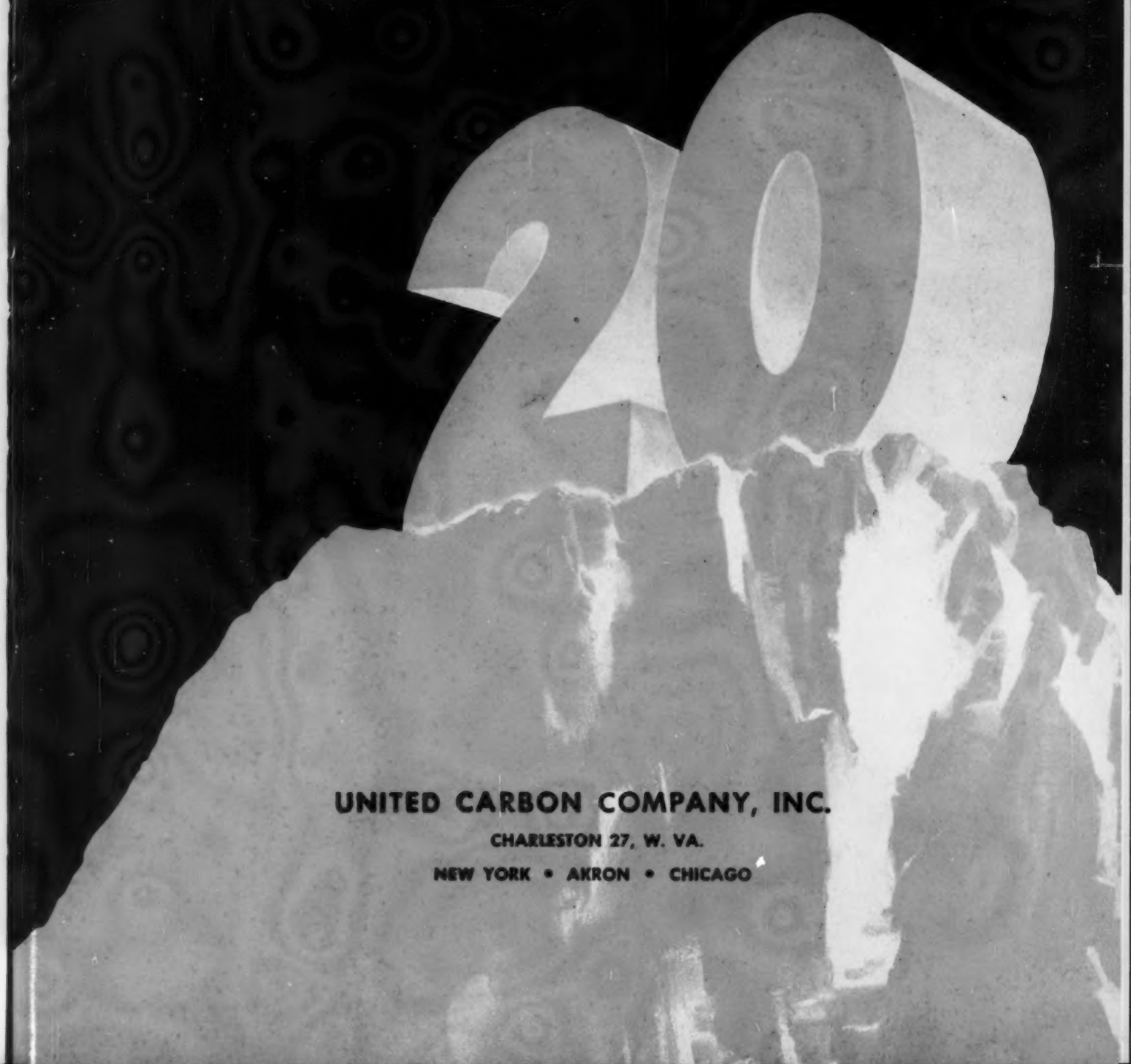
The challenge to America of switching from war to peace with a minimum of clashing gears is a big one.

But it is a small one compared to the tasks this nation has accomplished since Sunday, December 7, 1941.

Fred M. Vinson
*Secretary of the Treasury*

A Government message prepared by the War Advertising Council and contributed by this magazine in cooperation with the Magazine Publishers of America.

# KOSMOS DIXIE




**UNITED CARBON COMPANY, INC.**

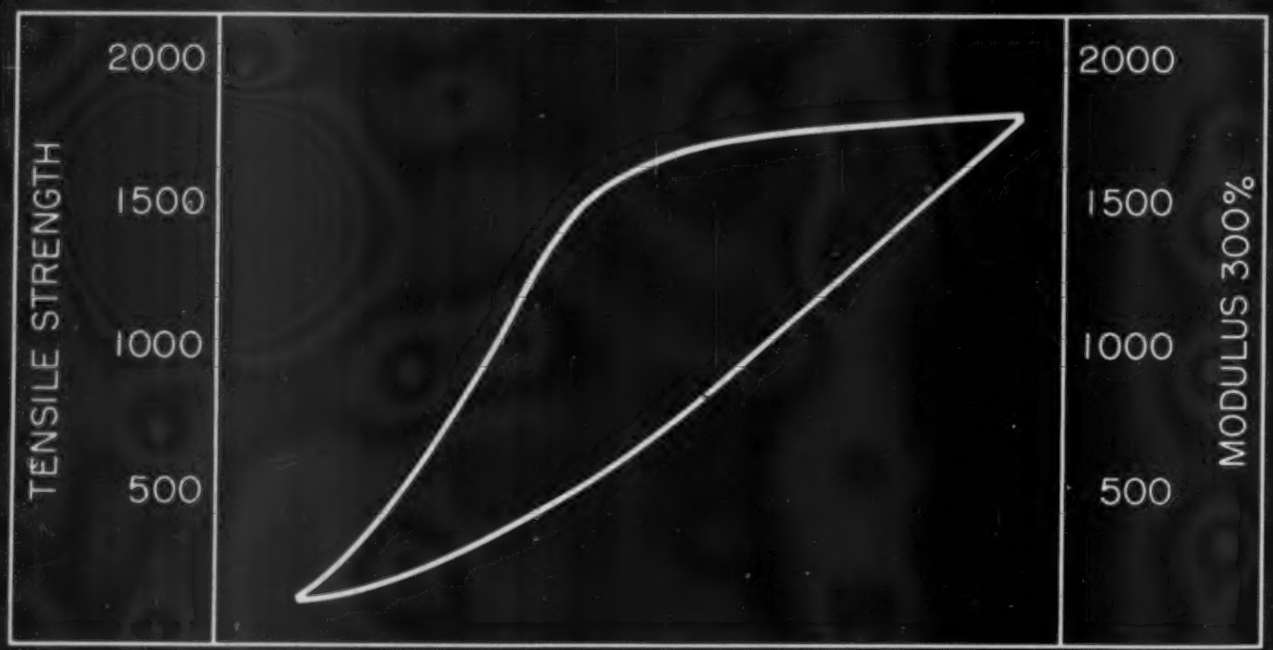
CHARLESTON 27, W. VA.

NEW YORK • AKRON • CHICAGO

# KOSMOS 20 · DIXIE 20

## SRF TYPE

SEMI-REINFORCING FURNACE DUSTLESS BLACK

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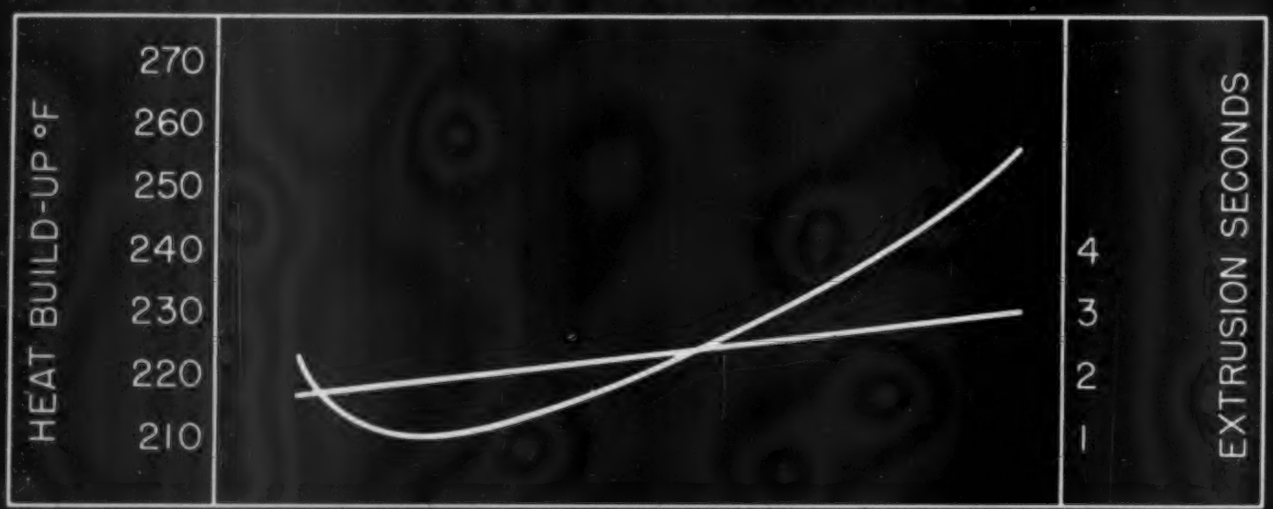
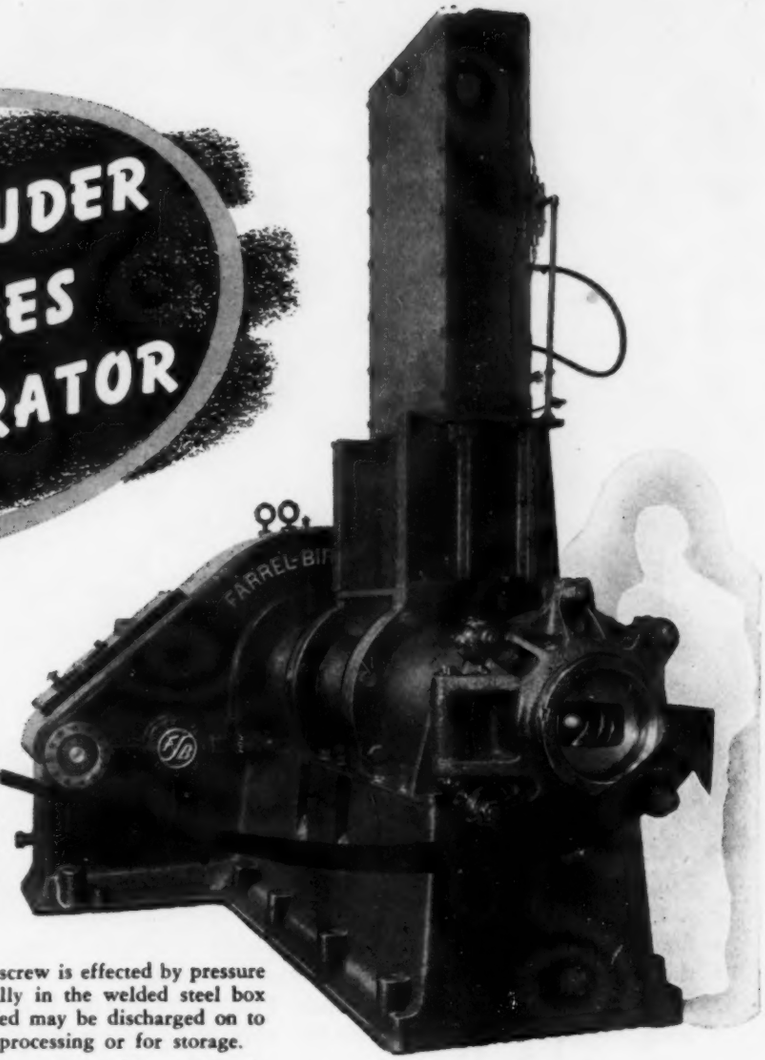



RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

CHARLESTON 27, W. VA.

# THIS EXTRUDER REQUIRES NO OPERATOR

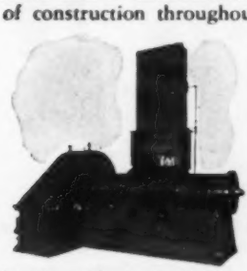


Farrel-Birmingham Extruder equipped with swinging head in which die is mounted.

Designed especially for extruding mixed rubber stock received by conveyor belt directly from a Banbury Mixer, this extruder functions *automatically,* starting and stopping by control interconnected with the Banbury operating cycle. It requires no operator of its own.

Positive feed of the rough chunks of stock to the screw is effected by pressure of the air-operated pusher which moves vertically in the welded steel box mounted on the hopper. The stock when extruded may be discharged on to another conveyor and carried away for further processing or for storage.

In addition to providing completely automatic operation, this machine is built to maintain original efficiency over a long period of time. The forward cylinder in which the screw operates is lined with a steel bushing, the inner surface of which is covered with an extremely hard and durable alloy called Xaloy, centrifugally cast in place. The screw itself also has its threads tipped with a hard-surfacing material. The hard surfaces of both the cylinder liner and the screw add considerably to the life of these parts. Meehanite, a processed iron of unusual strength and durability, is used to provide ruggedness of construction throughout the machine.



Extruder without die head, showing the pusher in raised position.

The forward and middle sections of the cylinder are jacketed for steam or water circulation, and the screw is cored and fitted with a stuffing box and distributing pipe for temperature regulation.

Easily capable of handling the full output of a size 11 Banbury, this extruder can be used for processing stocks in the manufacture of various rubber products.

If you feel there might be a place for this modern machine in your plant, we shall be glad to send you outline drawings, specifications and details of its control system. Write today, no obligation.

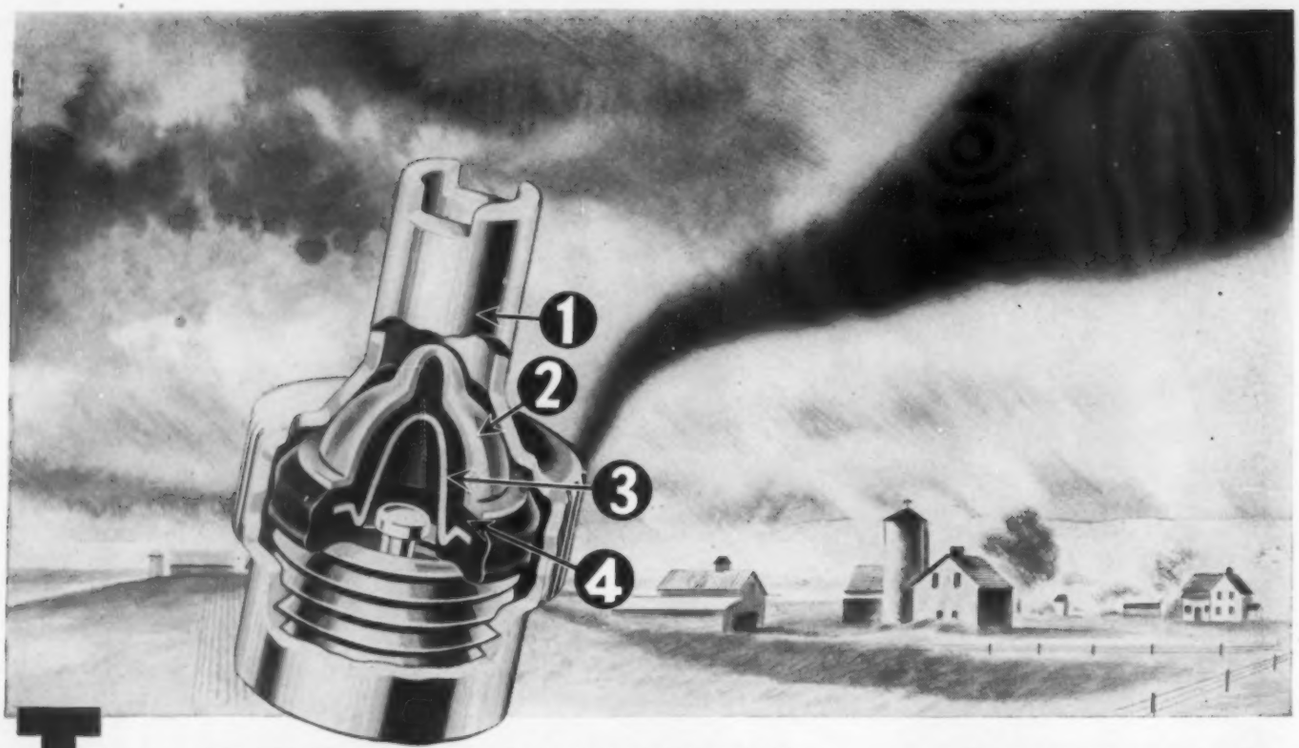
**FARREL-BIRMINGHAM COMPANY, INC. • ANSONIA, CONN.**
Plants: Ansonia, Derby and Stonington, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston, Charlotte

**F-B**
**PRODUCTION UNITS**

- Banbury Mixers
- Plasticators
- Pelletizers
- Mixing, Grinding, Warming and Sheeting Mills
- Bale Cutters
- Tubing Machines
- Refiners
- Crackers
- Washers
- Calenders
- Hose Machines
- Hydraulic Presses and other rubber working equipment.

FB-265

*Farrel-Birmingham*




# The CAP that HOLDS a TORNADO

**2,000 pounds** pressure per square inch! That's really pressure. Yet, when you give a Schrader Valve Cap the final finger twist, you set up that much contact pressure between the washer surface and the valve mouth—strong enough to hold air pressure up to 250 pounds. That's why this mighty midget—the Schrader Cap—is such a giant in sealing power.

To understand how such sealing power is packed into a tiny cap, look at the inside of the cap above. The molded rubber washer (4) protected top and bottom by brass plates (2 and 3) does the job. When screwed down firmly by hand, the specially engineered 1-2-3-4 piece construction provides a positive airtight seal.

Schrader advertising tells this story to your motorist customers, tells the need for Schrader Caps to help prevent ruinous underinflation.

Do your customers a service and build good will. Help them to protect their precious tires by seeing that a Schrader Cap is on every tire valve, including the spare.

Schrader
TIRE VALVE CAPS
Schrader
This Seals the Air!
HERE IS WHAT WE ARE SAYING IN OUR ADVERTISING TO YOUR CUSTOMERS...
"Schrader Caps are again available at your dealers, in the familiar red, white and blue box—
Complete set of 5 caps—25 cents—U.S.A."

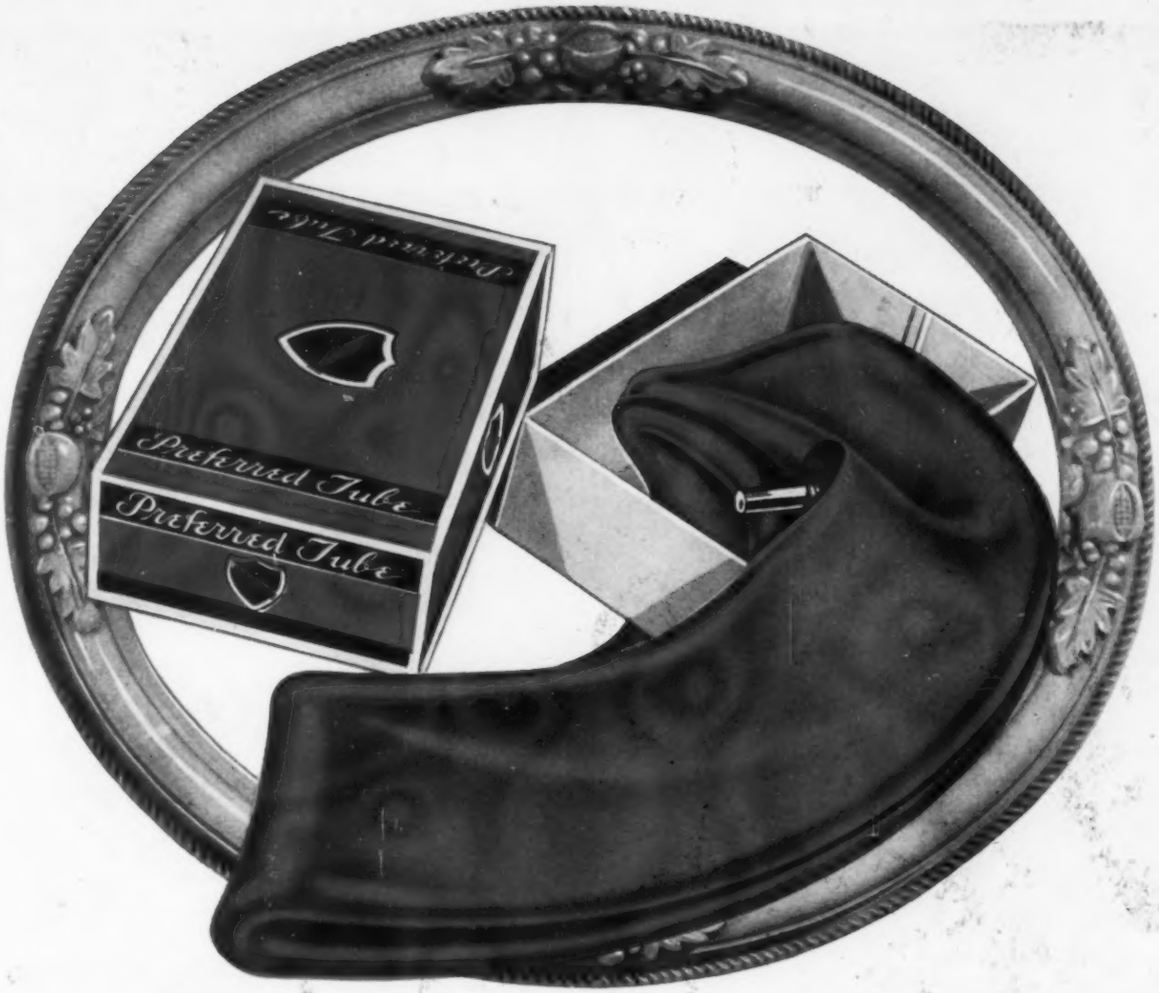
## CAPS are vital for TIRE CONSERVATION

*Check your present stock—order more if you need them.*

**Have you tried the Comparative Air Loss System of Flat Prevention?** *A copy of "How to Prevent Roadside Flat Tires," an explanation of the Comparative Air Loss System, as described in the Office of Defense Transportation Bulletin, is available from Schrader upon request.*

**Schrader**
CONTROLS THE AIR

**A. SCHRADER'S SON,** *Division of Scovill Manufacturing Company, Incorporated,* **BROOKLYN 17, NEW YORK**




# AN OLD-FASHIONED PORTRAIT COMES TO LIFE

It has been a memory — a happy memory to millions of motorists. It was a beauty as they remembered it, worthy of admiration for its handsome appearance and fine, serviceable life. . . A cherished picture, yes; but it is coming back to reality. With the release of butyl rubber soon and the availability NOW of SILENE EF a *better* inner tube will be the order of the day. SILENE EF makes that *better* tube possible. It assures success in color compounding for *red* tubes. . . SILENE EF is essential in non-black butyl tube compounds to give them the processing qualities, and the good cured physical properties unobtainable when clays or whitings are used alone as the principal loading pigment.

# SILENE EF

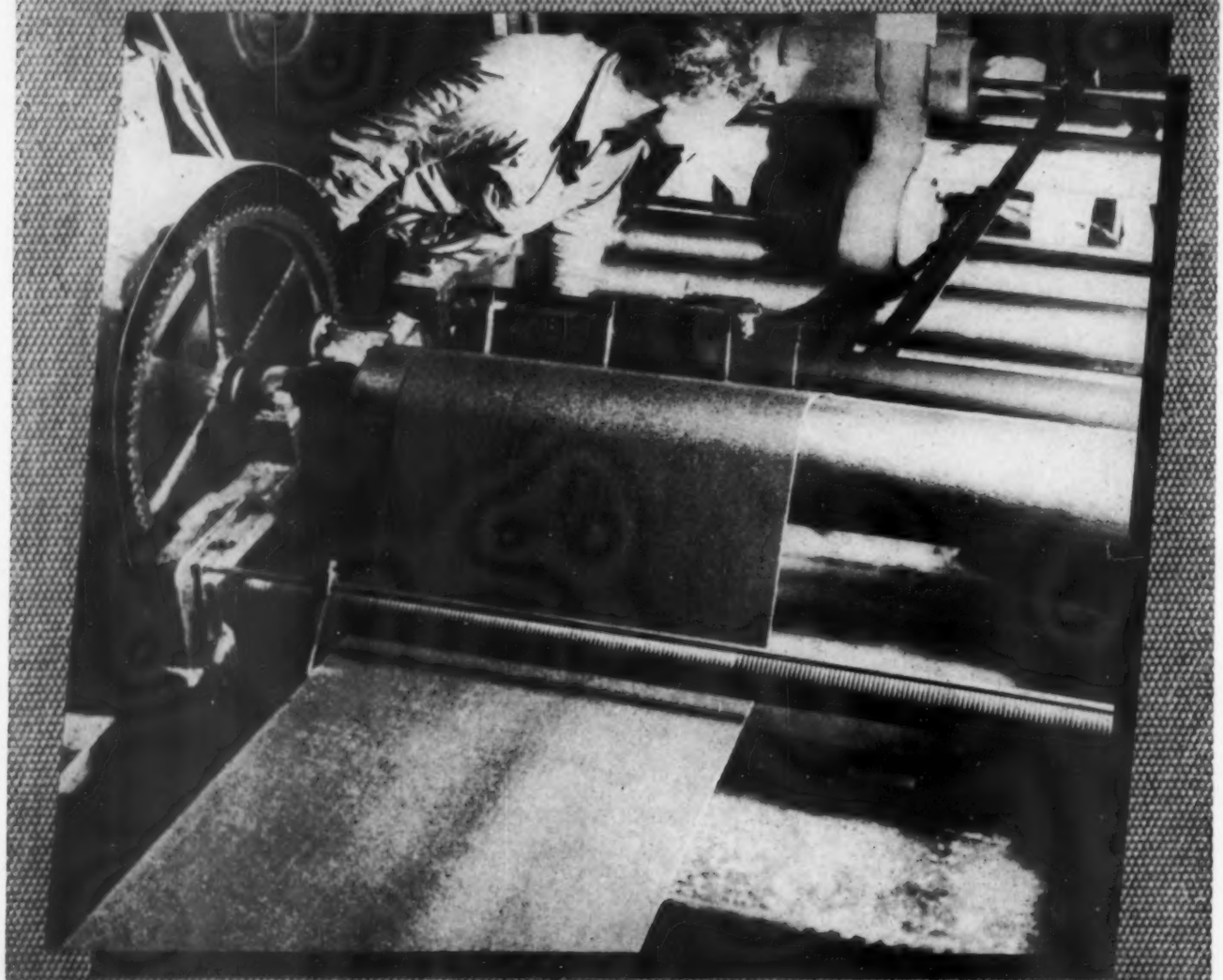
STANDARD Chemical Company

General Offices: AKRON 8, OHIO

New England: 335 Chamber of Commerce Bldg., Boston, Mass.
Mid-West: 2724 W. Lawrence Ave., Chicago, Ill.

MT. VERNON FABRICS

ASSOCIATED WITH UNIFORM QUALITY FOR OVER HALF A CENTURY



Quality Backed Up with Quality Fabrics

Rubber products backed with MT. VERNON fabrics get their first assurance of quality in MT. VERNON's laboratories. For that's where every step in the production of these top quality cotton fabrics is guided and directed — to insure the uniform weave that means more uniform rubber products whenever you specify MT. VERNON fabrics.

MT. VERNON WOODBERRY MILLS, INC.

TURNER HALSEY COMPANY

*Selling Agents*

40 WORTH STREET * NEW YORK, N. Y.

CHICAGO · NEW ORLEANS · ATLANTA · BALTIMORE · BOSTON · LOS ANGELES · SAN FRANCISCO

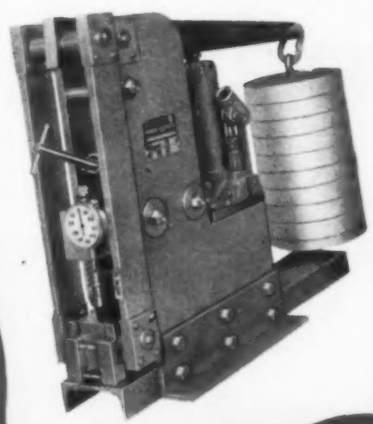
# THE *Only Oven* MADE EXCLUSIVELY FOR THE DEFORMATION OR COLD FLOW TEST OF *Plastics and Rubber*

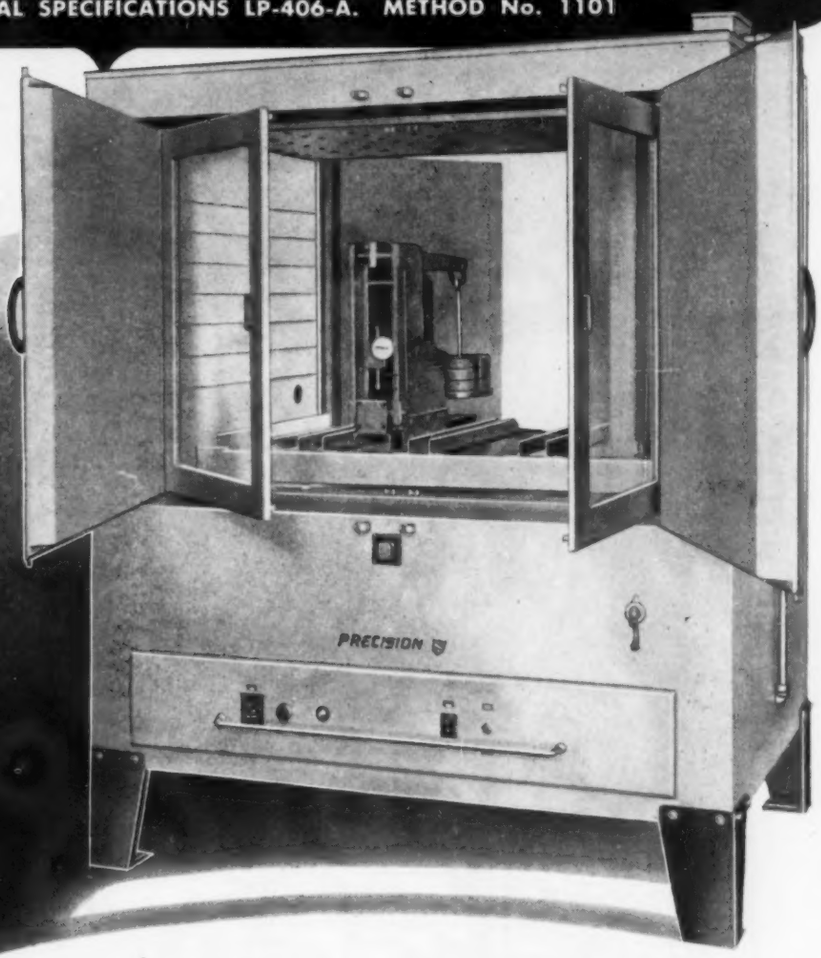
ASTM D-530, D-621 AND FEDERAL SPECIFICATIONS LP-406-A. METHOD No. 1101

## FEATURES

This oven is a "Precision" floor type mechanical convection oven with temperature range from 49° to 100° C. It is equipped with one adjustable thermostat and one Merc-to-Merc thermostat for fixed temperatures permitting quick change of temperature setting. The oven is constructed of sheet metal throughout, with stainless steel interior. Two fully insulated outer doors open upon 2 inner Pyrex glass doors, permitting observation of deformation on the dial gage without loss in temperature. Two rear opening doors facilitate loading and unloading. All doors open to the full width and height of the test chamber. The finish is of high temperature resisting aluminum. The outside dimensions are 61" wide x 42" deep x 78" high. Electrical characteristics: 220 or 440 Volts, 60 Cycles, Three phase current, 7200 Watts.

*Write for complete information in Bulletin No. 10019-K*






## THE "PRECISION" DEFORMATION OR COLD FLOW TEST OVEN

Specifically developed to accommodate four "Precision" Deformation or Cold Flow Testers (see illustration on the **left**) this oven incorporates many unusual "Precision" engineering features which permits easy, accurate testing in rigid conformity to A.S.T.M. methods as designated above. The tester in conjunction with this oven measures the flow, or deformation of a ½" cube of plastic, hard rubber or fibre which undergoes a constant, sustained compression of 1000 lbs.—equivalent to 4,000 lbs. per square inch, at the specified temperature. Allows four specimens to be tested simultaneously.

The Deformation or Cold Flow Tester can be used to measure the compression and recovery of sheet packings, cardboard, composition, fiberboard, wood, plywood and rigid elastomeric sheets. It can be used wherever the compression and/or recovery is desired using a fixed load of from 100 to 1000 lbs. in increments of 100 lbs.

*See Your Laboratory Supply Dealer*

**PRECISION SCIENTIFIC COMPANY**
1736-54 N. Springfield Ave., Chicago 47, U.S.A.
*Engineers and Builders of Scientific, Research and Production Control Equipment*

# RECLAIMED RUBBER

## PEQUANOC RUBBER CO.

QUALITY RECLAIMS FOR SPECIFIC PURPOSES

*Factory and Main Office:* **BUTLER, NEW JERSEY**

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BACK BAY, BOSTON, MASS.

*European*
**BURNETT & CO. (London) Ltd.**
46 HERGA COURT
HARROW-ON-HILL, MIDDLESEX, ENGLAND

# Specify SHARPLES VULTAC

## to improve HEAT-RESISTANCE of your products

Sharples VULTACS — offered in three modifications varying in sulfur content — provide a new approach to the problem of building heat-resistance into both GR-S and GR-A formulations.

VULTAC No. 2 and VULTAC No. 3 may be used advantageously as total replacements for sulfur to give GR-S and GR-A stocks capable of withstanding temperatures of up to 250° F. over extended periods. This effect is particularly pronounced when they are used in conjunction with thiuram type vulcanizing agents in compounding GR-S. As supporting evidence, data in the table illustrate that VULTAC No. 2, when used in combination with Ethyl Tuads, results in a GR-S stock combining outstanding heat resistance with the following superior qualities:

1. Maintenance of tensile strength and elongation upon extended cure.
2. Retention of tensile strength and elongation after severe aging.
3. Lower "Marching Modulus" upon aging.

Other advantages realized through the use of these new primary vulcanizing agents are:

BETTER PROCESSING CHARACTERISTICS — The VULTACS soften at milling and Banbury mixing temperatures — a property which combined with their solubility characteristics permits incorporation very readily in the rubber mix. When added during early stages of mixing they serve as processing aids and at the same time improve the dispersion of fillers and pigments.

IMPROVED TACK — VULTAC No. 1 as a monosulfide is a milder vulcanizing agent than the disulfides, VULTAC No. 2 or VULTAC No. 3, and can be tolerated in larger proportion without producing over-cure. Its use is therefore recommended for those applications requiring larger amounts to obtain maximum tack and at the same time good heat resistance will be imparted to the stock. When VULTAC No. 1 is used, it is necessary to add a certain amount of pigment sulfur to the mix.

### FORMULA

| | |
|---|---|
| GR-S | 100 |
| EPC Carbon Black | 50 |
| Zinc Oxide | 3 |
| Coal Tar Softener | 5 |
| Rosin Turpentine | 5 |
| Coumarone-Indene Resin (Medium Hard) | 3 |

| Ethyl Tuads ..... 1.75 parts<br>VULTAC No. 2..... 4.0 parts | | | | Minutes Cure at 290° F. | Ethyl Tuads ..... 0.5 parts<br>Sulfur ..... 2.0 parts | | | |
|---|---|---|---|---|---|---|---|---|
| Modulus 300% | Tensile p.s.i. | Elongation % | Shore Hardness | | Modulus 300% | Tensile p.s.i. | Elongation % | Shore Hardness |
| ORIGINAL PROPERTIES | | | | | | | | |
| 380 | 1890 | 850 | 54 | 10 | 90 | 280 | 880 | 50 |
| 430 | 2110 | 810 | 60 | 15 | 350 | 1670 | 820 | 59 |
| 510 | 2310 | 770 | 60 | 30 | 780 | 2890 | 700 | 61 |
| 520 | 2440 | 750 | 60 | 45 | 920 | 2910 | 650 | 65 |
| 600 | 2590 | 750 | 64 | 60 | 980 | 2500 | 550 | 65 |
| AFTER AGING 72 HRS. AT 212° F. IN AIR OVEN | | | | | | | | |
| 1360 | 3040 | 570 | 70 | 10 | 1150 | 2200 | 520 | 70 |
| 1340 | 3180 | 610 | 71 | 15 | 1570 | 2850 | 530 | 74 |
| 1170 | 3090 | 660 | 71 | 30 | 1750 | 2890 | 480 | 75 |
| 1070 | 2970 | 680 | 71 | 45 | 1870 | 2700 | 420 | 75 |
| 1020 | 3150 | 670 | 71 | 60 | 1750 | 2370 | 400 | 75 |
| AFTER AGING 144 HRS. AT 212° F. IN AIR OVEN | | | | | | | | |
| 1330 | 3050 | 580 | 71 | 10 | 1420 | 2050 | 420 | 70 |
| 1320 | 3050 | 590 | 71 | 15 | 1990 | 2500 | 380 | 76 |
| 1190 | 2890 | 640 | 71 | 30 | 2280 | 2530 | 340 | 78 |
| 1180 | 2900 | 640 | 73 | 45 | — | 2200 | 280 | 80 |
| 1180 | 2700 | 610 | 73 | 60 | — | 1930 | 240 | 80 |

Additional information is presented in Sharples Booklet 44-1 entitled VULTAC. A copy of the booklet together with samples will be sent at your request.

SHARPLES TRADE MARK CHEMICALS

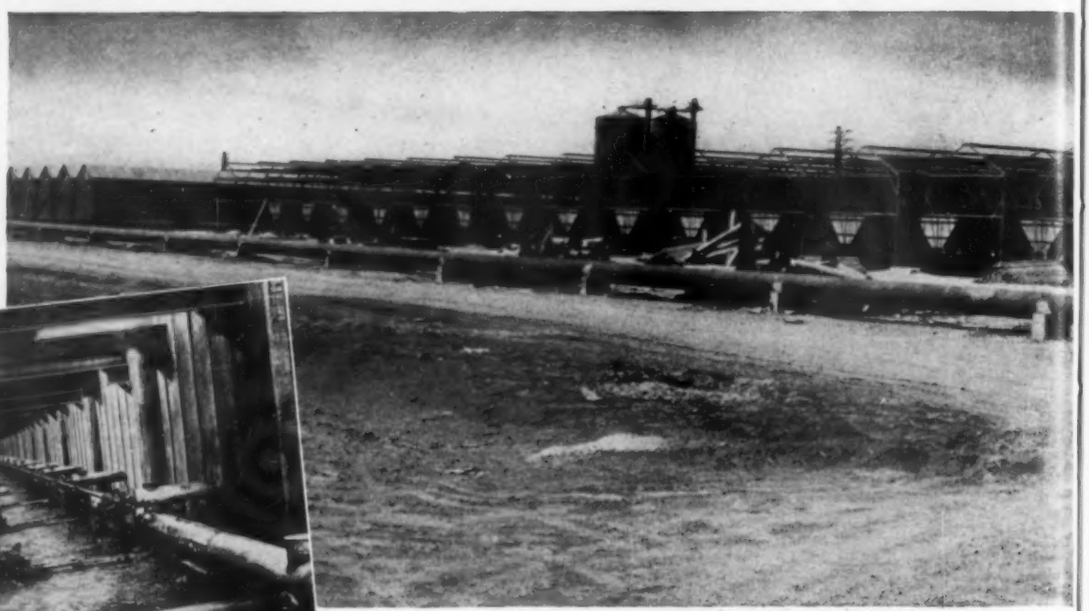
# SHARPLES CHEMICALS INC.

PHILADELPHIA CHICAGO NEW YORK

ARMY E NAVY

# *Background* FOR A FIRST LINE SERVICE IN CARBON BLACK

Up-to-the-minute methods and equipment, such as these gas distributing and black collecting systems, are in use at Continental's plants.



Typical of Continental's modern, large scale facilities is this new channel black plant at Sunray, Texas.

As a result of its policy of looking ahead and anticipating the needs of the rubber industry for carbon black, Continental Carbon Company is in a position to give a complete and highly advanced service in this vital material.

Continental has recently completed and put into operation a large DPC channel black plant, and a furnace type black plant especially designed for the production of Continental SRF. Both of these new plants are equipped with the latest and finest facilities available and are backed by the cooperation and technical assistance of the Witco research laboratories.

Whether you need channel or furnace type black, for use in either natural or synthetic rubber formulations, look to Continental for *complete* service.

**HAVE YOU OBTAINED YOUR COPY OF THE NEW WITCO CARBON BLACK MANUAL?**
**This comprehensive, up-to-date compilation of facts on the properties and applications of channel and furnace blacks produced by Continental and Witco will be sent on request.**

**CONTINENTAL CARBON COMPANY**

*MANUFACTURER*

**CONTINENTAL CHANNEL AND FURNACE BLACKS**

**WITCO CHEMICAL COMPANY**

*DISTRIBUTOR*

**[FORMERLY WISHNICK-TUMPEER, INC.]**

*MANUFACTURERS AND EXPORTERS*

## A WELCOME ADDITION TO THE FAMILY

# Perbunan 18

## Low-temperature synthetic rubber compounds at low cost . . . *an economical engineering material*

These data show that Perbunan 18 can be compounded with low-cost plasticizers to produce high-quality stocks. The excellent low-temperature properties give a margin of safety which adds to the ever-increasing number of uses for Perbunan synthetic rubber.

**RECIPE:**

| | |
|---|---|
| Perbunan 18 | 100.0 |
| Zinc Oxide | 5.0 |
| Stearic Acid | 1.0 |
| Semi-Reinforcing Furnace Black | 75.0 |
| Altax | 1.0 |
| Sulfur | 1.5 |
| Softeners (shown below) | 20.0 |

| FORMULA: | | BRT No. 7 | Cumar P25 | Dibutyl Phthalate | Tributoxy ethyl Phosphate |
|---|---|---|---|---|---|
| ASTM Low Temperature Brittleness Test D736-43 T | O.K. at | —55°F. | —80°F. | —85°F. | —85°F. |
| | Broke at | —60°F. | —85°F. | —90°F. | —90°F. |
| Original Physical Properties: (Cured 60 minutes at 287°F.) | | | | | |
| Shore Hardness | | 56 | 48 | 49 | 41 |
| Tensile psi | | 1760 | 2170 | 2050 | 2160 |
| Elongation at Break Per cent | | 870 | 650 | 540 | 500 |
| Modulus; psi at 300% Elongation | | 700 | 960 | 1040 | 1200 |
| Compression Set 30% Constant Deflection ASTM Method B 22 hours at 158°F. | | 28% | 23% | 23% | 22% |
| Immersion ASTM Test Oil Number 3 70 hours at 212°F. | | | | | |
| Tensile psi | | 1330 | 1190 | 1340 | 1550 |
| Elongation at Break Per cent | | 800 | 420 | 400 | 370 |
| Volume Change Per cent | | +37 | +33 | +31 | +32 |

**STANCO DISTRIBUTORS, INC.,** 26 Broadway, New York 4, N. Y.; First Central Tower, 106 So. Main St., Akron 8, Ohio; 75 East Wacker Drive, Chicago 1, Illinois. West Coast Representatives —H. M. Royal Inc., 4814 Loma Vista Avenue, Los Angeles 11, California. Warehouse stocks in New Jersey, Illinois, California and Louisiana.

PERBUNAN
REG. U. S. PAT. OFF.

**THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME.**

*The Stanco rubber technologists know how to develop rubber parts from Perbunan 18, keeping in sight the cost competition factor! These men are ready to help with tough problems. Don't hesitate to get in touch with the office nearest you.*

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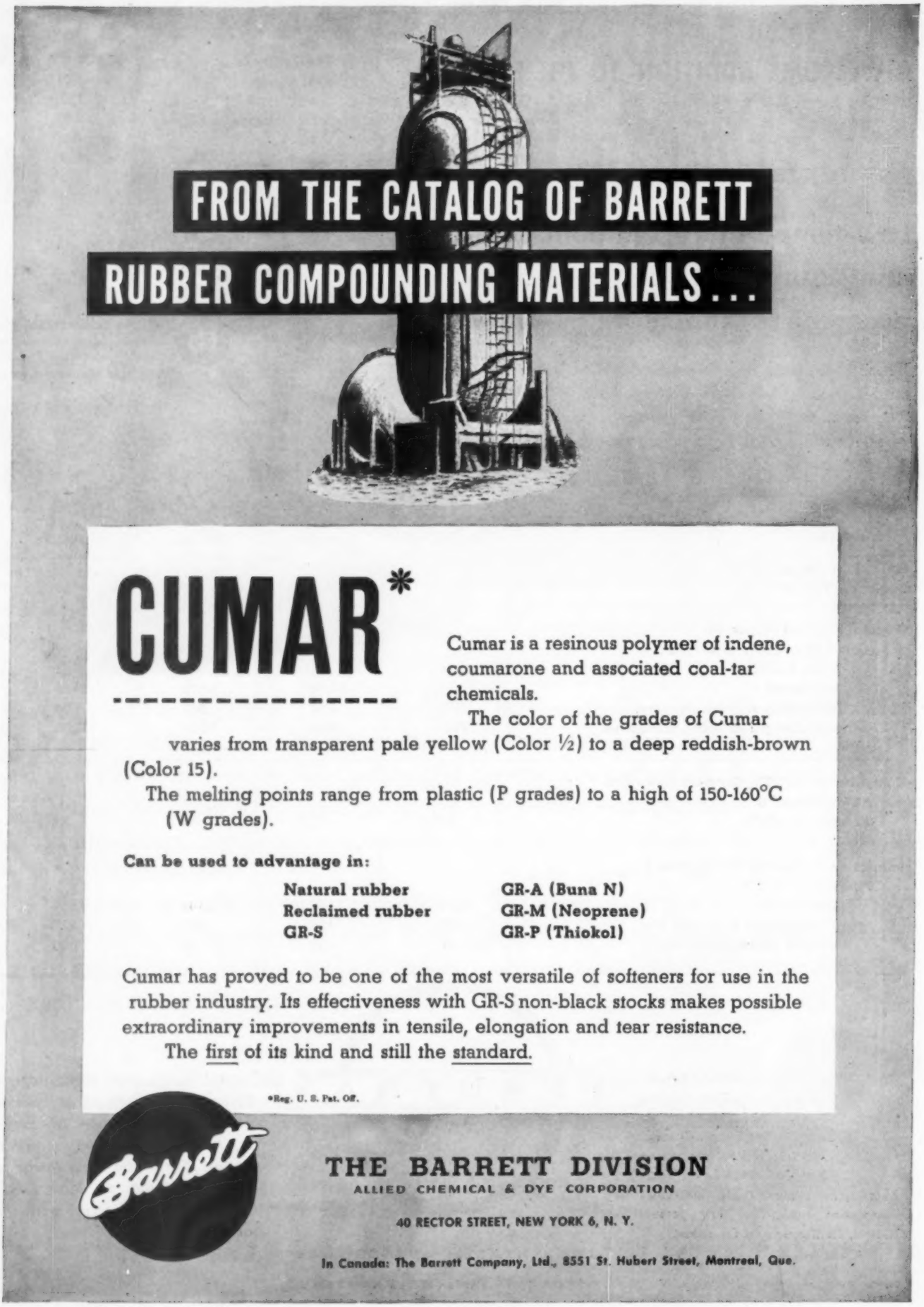



# CUMAR*

Cumar is a resinous polymer of indene, coumarone and associated coal-tar chemicals.

The color of the grades of Cumar varies from transparent pale yellow (Color ½) to a deep reddish-brown (Color 15).

The melting points range from plastic (P grades) to a high of 150-160°C (W grades).

**Can be used to advantage in:**

| | |
|---|---|
| **Natural rubber** | **GR-A (Buna N)** |
| **Reclaimed rubber** | **GR-M (Neoprene)** |
| **GR-S** | **GR-P (Thiokol)** |

Cumar has proved to be one of the most versatile of softeners for use in the rubber industry. Its effectiveness with GR-S non-black stocks makes possible extraordinary improvements in tensile, elongation and tear resistance.

The first of its kind and still the standard.

*Reg. U. S. Pat. Off.

Barrett

**THE BARRETT DIVISION**
ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

In Canada: The Barrett Company, Ltd., 8551 St. Hubert Street, Montreal, Que.

# BAKER *Plasticizers*

Diagram courtesy:
JOHN WALDRON CORPORATION
New Brunswick, New Jersey

LABORATORY REPORT

SUBJECT: KNIFE COATING plasticizer study.

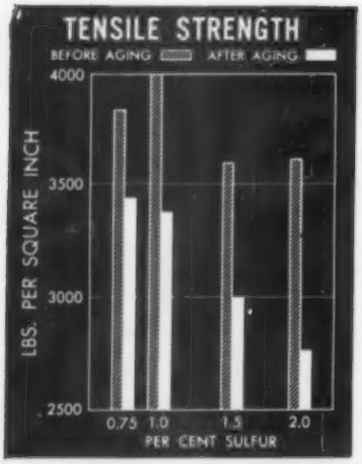
MATERIAL: Baker Plasticizers

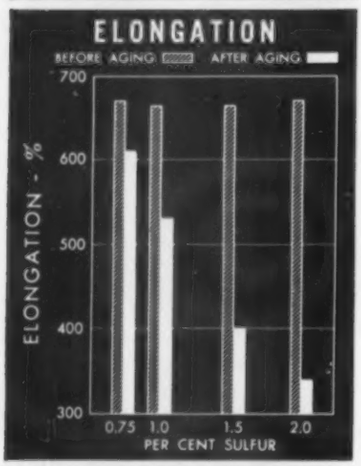
RETAINED FLEXIBILITY:

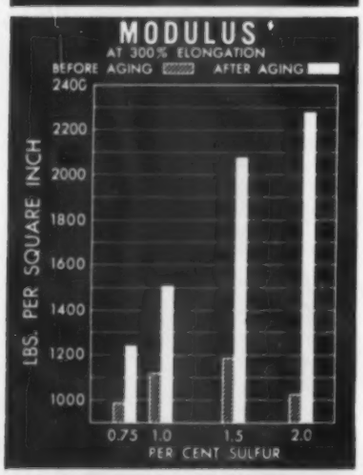
1. at low temperatures: Outstanding
2. at elevated temperatures: Excellent
3. after prolonged aging: Excellent

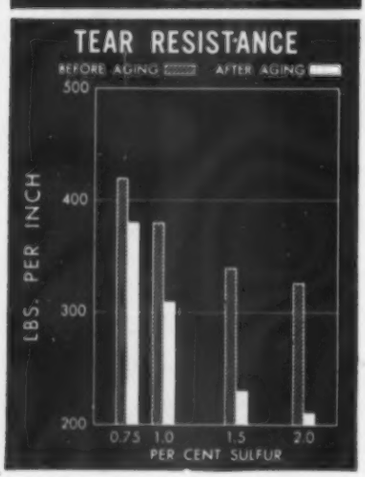
SUPPLIER: The Baker Castor Oil Company
120 Broadway, New York
Chicago
Los Angeles

# BAKER *Plasticizers*




# Give your GR-S Compounds heat stability provided by low sulfur content

***Safe, fast curing now made possible by FBS LITHARGE***

As you know, reduction in sulfur content means increase in heat stability.

It has now been demonstrated that FBS litharge (plus benzothiazyl disulfide) makes low sulfur formulas practicable.

Why?

Because it speeds up greatly the rate of cure without increasing the risk of scorching.

Thus, even though the normal quantity of accelerator is used, *the sulfur content can be reduced.*

Note, in the series of tests charted and tabulated, the superior behavior of the 0.75 and 1.0 sulfur formulas.

**FORMULA**

| | |
|---|---|
| GR-S (Institute) | 100 |
| E.P.C. Carbon Black | 50 |
| Zinc Oxide | 3 |
| Coal tar softener | 5 |
| Benzothiazyl Disulfide | 1.0 |
| FBS Litharge | 1.5 |
| Sulfur | variable |

***Effect of Varying Amounts of Sulfur on Physical Properties***

**(Curing period: 20 min. Temp: 287° F.)**

| *% Sulfur* | *Tensile Strength* | *% Elongation* | *Modulus at 300% Elong.* | *Tear Resistance* |
|---|---|---|---|---|
| 0.75 | 3840 | 670 | 980 | 420 |
| 1.0 | 4000 | 665 | 1120 | 380 |
| 1.5 | 3600 | 665 | 1190 | 340 |
| 2.0 | 3620 | 670 | 1025 | 325 |
| ***After Aging 24 Hours at 100° C.*** | | | | |
| 0.75 | 3460 | 610 | 1240 | 380 |
| 1.0 | 3380 | 530 | 1510 | 310 |
| 1.5 | 3000 | 400 | 2080 | 230 |
| 2.0 | 2770 | 340 | 2280 | 210 |

**CONCLUSIONS:**

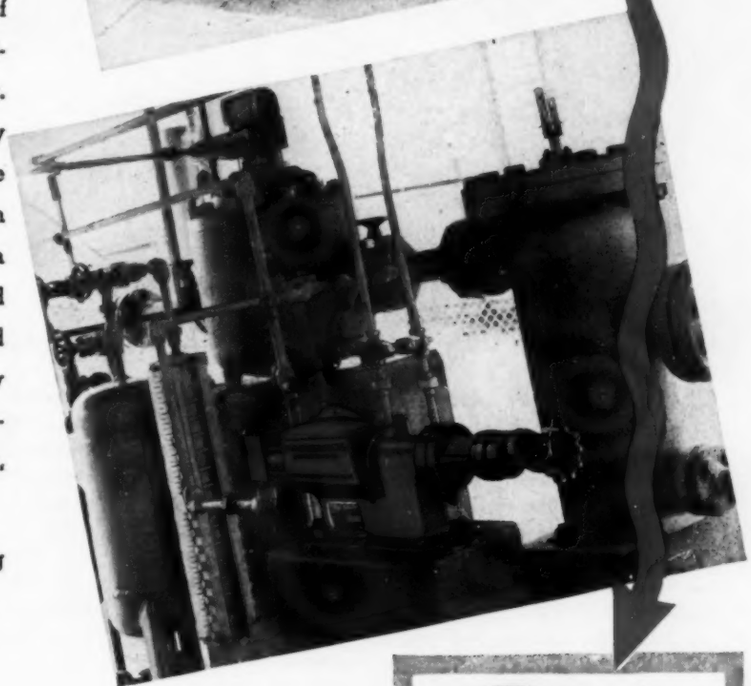
1. FBS Litharge-thiazole with low sulfur imparts heat stability.
2. Modulus is high and steady.
3. Elongation is retained despite exposure to heat.
4. Heat stability prevents brittleness and improves tear resistance.
5. Rate of cure is relatively fast, without tendency to scorch.
6. The combination is inexpensive and efficient.

Ask us to send you a printed report, "Compounding of GR-S for Heat Resistance," issued by the Rubber Division of our Research Laboratories, which covers the subject of FBS Litharge for low sulfur formulae in greater detail and from a number of additional angles.

**NATIONAL LEAD COMPANY** New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco: Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.).

# SAVE BY "Composite Checking"

## OF YOUR FLUID RAW MATERIALS WITH %PROPORTIONEERS% AUTOMATIC SAMPLING



**CONTINUOUS**
**PROPORTIONAL SAMPLING**
**AT THE**
**NECHES BUTANE PRODUCTS CO.**

Automatic Sampling protects the purchaser of bulk shipments and assures him that the product received is up to specification standards. Diluence and foreign solvents are immediately detected by means of a single composite sample which may be readily varied in size from one barrel a day to five gallons a week. Equipment is fully flow responsive and meters main flow accurately. Several hundred %Proportioneers% sampling machines are now in use checking shipments of solvents, gasolines, food products oils, process chemicals, effluents, etc.

There are other %Proportioneers% processing systems for Treating, Blending and Diluting.

Write for Bulletins
No. 1700 and R. E. F.

*Streamline* PROCESSING PAYS

# % PROPORTIONEERS, INC. %

WRITE TO %PROPORTIONEERS, INC.%, 66 CODDING ST., PROVIDENCE 1, RHODE ISLAND

# Want to improve your products

## in any of these respects?

# call on WHITTAKER

SALES of most products made by your industry are strongly influenced by one or more of these factors. To meet new competition, most manufacturers are now checking their products critically — as their customers do. If you find you might profitably improve your products in any of these vital respects — or cut the cost of imparting these qualities to your products — there's a good possibility that Whittaker can help you do it.

Minerals, colors and pigments are Whittaker's field. Today, many Whittaker materials are being used in ways undreamed of before the war

Astonishing possibilities exist for the further application of minerals, colors and pigments to new and improved products. There are few better ways to explore these possibilities than through Whittaker's research and testing facilities and Whittaker's hundreds of types and grades of materials, some of them not elsewhere available.

"Call on Whittaker" — anytime — for technical data, working samples, or for suggestions on any problem which you feel minerals, colors and pigments may possibly help you solve.

WHITTAKER

EST. 1890

⊕ 255

**Whittaker, Clark & Daniels, INC.**

260 West Broadway, New York 13, N. Y. • Plant: South Kearny, New Jersey

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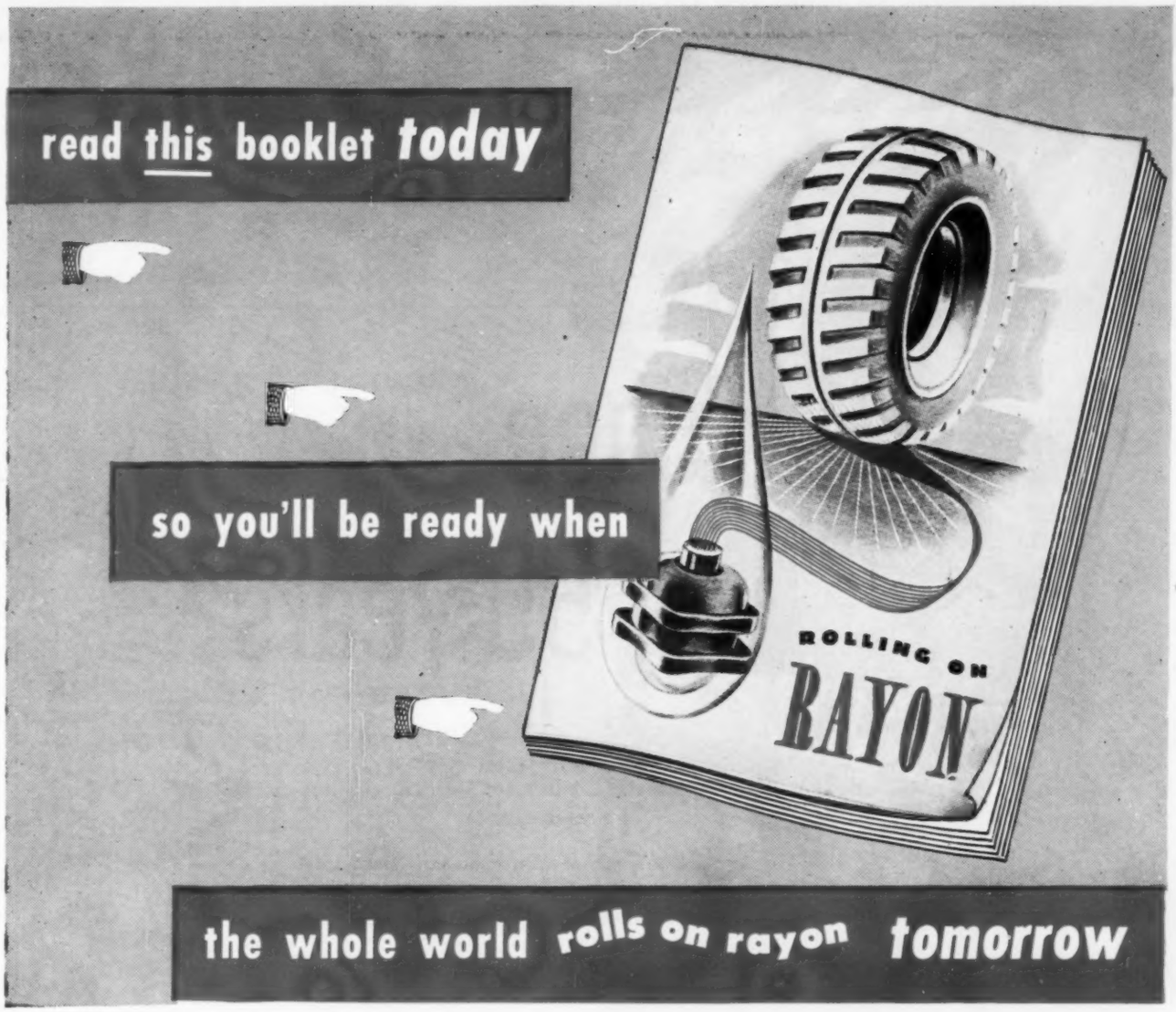


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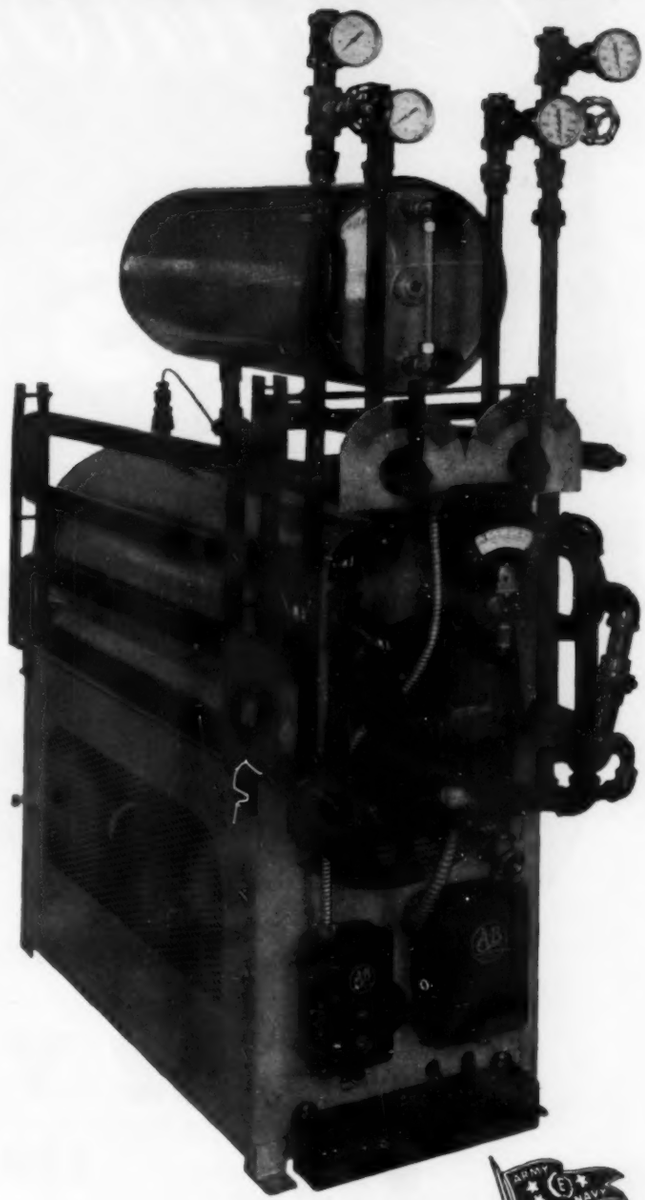

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## CONTENTS FOR NOVEMBER, 1945


The Compounding and Processing of Butaprene N—*By R. H. Crossley and C. G. Cashion* ..... 197

Synthesis of Rubber in Kok-Saghyz Roots During Starvation—*By J. McGavack and P. J. Faulks* ..... 204

GR-S Latex—*By F. S. Conover* ..... 207

Summary Report on the Production and Performance of German Synthetic Tires and Other Transportation Items: Part IV—Conclusion ..... 210

General Tire Co.'s New Tire Building Machine ..... 216


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### REGULAR DEPARTMENTS


| | | | |
|---|---|---|---|
| New Equipment Section .... | 248 | Coming Events ..... | 227 |
| Book Reviews ..... | 254 | Obituaries ..... | 244 |
| Editorial ..... | 218 | Los Angeles News ..... | 240 |
| Financial News ..... | 237 | Rubber, Cotton Markets .... | 260 |
| Names in the News ..... | 236 | Chemical Markets ..... | 262 |
| Canadian News ..... | 242 | Classified Ads ..... | 264 |


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VOL. 58, No. 2 **RUBBER AGE** NOVEMBER, 1945

# The Compounding and Processing of Butaprene N

By R. H. CROSSLEY and C. G. CASHION
*Xylos Rubber Co., Akron, Ohio*

BUTAPRENE N is the name of a family of oil-resisting synthetic elastomers developed by the Firestone Tire & Rubber Company. Three types of Butaprene N are being produced commercially; namely, Butaprene NXM, Butaprene NL and Butaprene NF, and a discussion of the properties, processing and uses of these three types of Butaprene N will form the basis of this article.

The Butaprene N elastomers are modified copolymers of butadiene and acrylonitrile. Although they show somewhat less unsaturation than natural rubber, they may be vulcanized with sulfur, and their physical properties are influenced by accelerators and activators in a manner similar to those of natural rubber.

Butaprene NXM is characterized by excellent tensile strength and a high degree of resistance to deterioration upon exposure to oils and fuels. Butaprene NL is moderately fuel- and oil-resistant, and is superior to Butaprene NXM in resistance to stiffening at low temperatures. Butaprene NF is the least oil-resistant of all, being of value in applications requiring positive swell in high aniline-point oils, and is characterized by excellent cold-resistance. Compounds may be made from Butaprene NF which will pass both brittle point *(3)* and A.S.T.M. bend tests at from —70° F. to —85° F., depending upon the type and amount of plasticizer used. The basic differences in physical properties between the different types of Butaprene N, when compared in a typical test formula (Formula A), are shown graphically in Figure 1.

The Butaprene N elastomers are characterized by good factory-handling properties, and are completely compatible with one another, so that specific properties may be obtained from blends of two or more types which could not be obtained from a single polymer. Products having a high degree of resistance to heat-aging, abrasion, flexing and hot compression- or extension-set may be made from properly compounded Butaprene N.

## Basic Compounding

The compounding of the Butaprene N polymers is essentially similar to that of natural rubber. Since these materials are unsaturated hydrocarbons, they may be vulcanized with sulfur, organic polysulfides and other vulcanizing agents which are used with natural rubber. The three types of Butaprene N have generally similar compounding characteristics, and principles which apply to one apply to all. For simplicity, therefore, in some cases data on only one polymer is presented. As with rubber, accelerators increase the

TEST FORMULAS

| | A | B | C | D* |
|---|---|---|---|---|
| Polymer | 100 | 100 | 100 | 100 |
| Bardol | 5 | ... | 5 | ... |
| Dibutyl Phthalate | 5 | ... | 5 | ... |
| Tributoxyethyl Phosphate | ... | ... | ... | 20 |
| Test Softener (See Fig. 4) | ... | 25 | ... | ... |
| Zinc Oxide | 5 | 5 | 5 | 5 |
| Stearic Acid | 1 | 1 | 1 | ... |
| Semi-reinforcing Black | 50 | 32 | 50 | ... |
| Fine Thermal Black | ... | 32 | ... | 60 |
| Benzothiazyl Disulfide | 1 | 1 | (See *** Fig. 5) | (See *** Fig. 6) |
| Sulfur | 2 | 2 | 2 | 2 |
| Antioxidant ** | 2 | 2 | 2 | 2 |

* One part stearic acid added when sulfur and benzothiazyl disulfide were used.
** Polymerized trimethyl dihydroquinoline type.
*** Abbreviations of accelerators used in Figures 5 and 6 are as follows: BTDS—Benzothiazyl disulfide; TMTDS—Tetramethyl thiuram disulfide; TETDS—Tetraethyl thiuram disulfide.

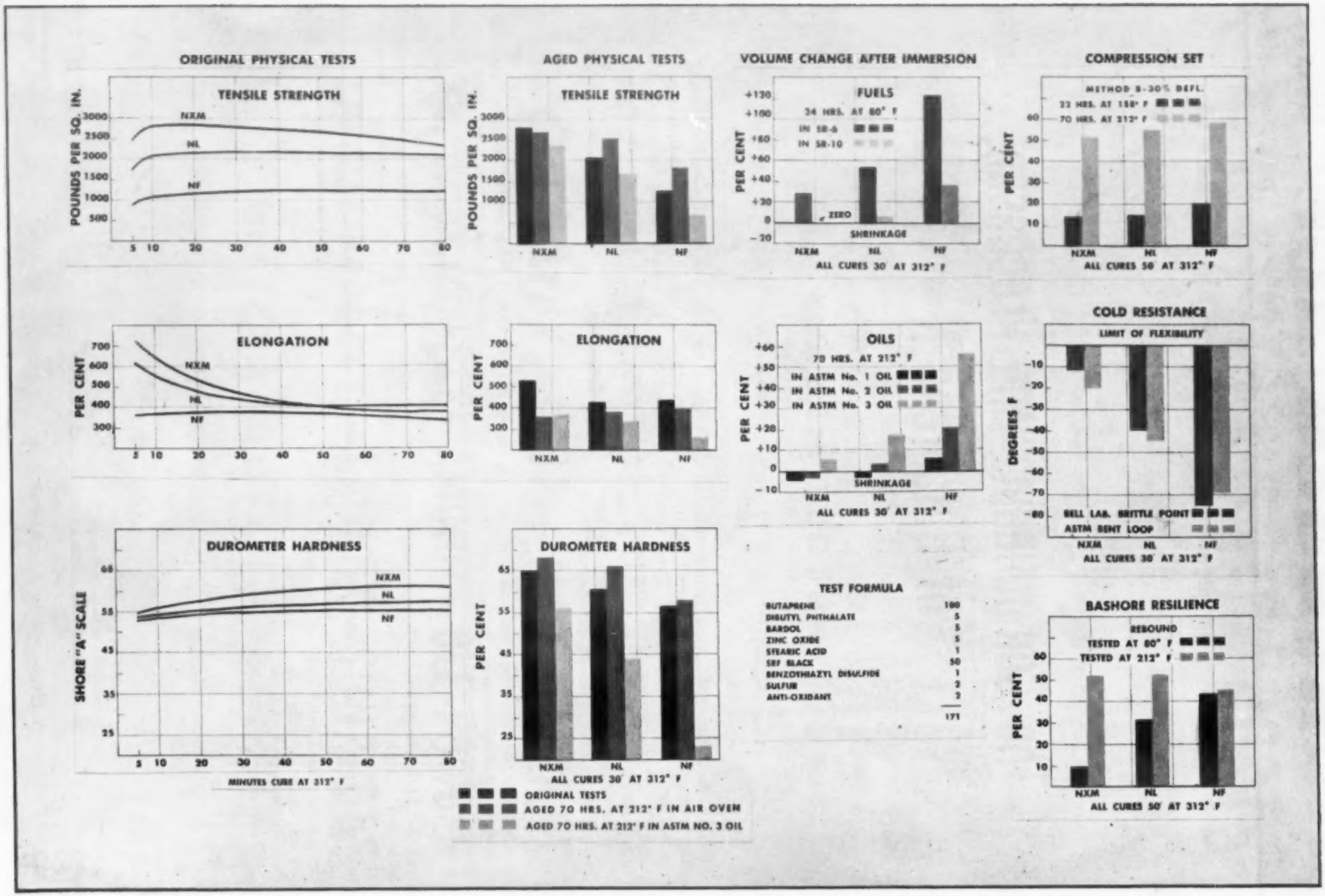


FIG. 1. COMPARISON OF PROPERTIES OF BUTAPRENE NXM, NL AND NF.

rate of cure, and metallic oxides and fatty acids are desirable for accelerator activation. On the basis of extensive previous laboratory work by the authors, the ratios of zinc oxide, stearic acid, curatives and antioxidants shown in Formula A are recommended as satisfactory concentrations to use with all the Butaprene N types.

Like most other elastomers, Butaprene N requires the addition of reinforcing fillers in order to obtain maximum physical properties. Carbon blacks are most commonly used for this purpose, and the effects of various loadings on the physical properties of Butaprene NXM in Formula A are shown in Figure 2. Butaprene NL and NF are similar to Butaprene NXM in their behavior under the same loading conditions, differing only in the numerical values of the physical properties. Considerable such data has already been published on Butaprene NF *(3)*. It is of interest to note that at constant loadings the highest physical properties are obtained with the hardest blacks. Clays and silicates impart reinforcement of the order of that imparted by SRF black while materials like ordinary whiting have little or no reinforcing power. Figure 3 shows the effects of various compounding ingredients on Butaprene NL in Formula A.

## High Concentration of Plasticizers

The greatest differences between the compounding of the Butaprene N elastomers and that of natural rubber are in the selection of softeners or plasticizers. Unlike natural rubber, these elastomers ordinarily require the addition of comparatively high concentrations of softeners in order to be processed satisfactorily in the factory. High softener ratios (from 15 to 30 parts per 100 parts of Butaprene N are generally used) necessarily play a significant part in modifying the physical properties of the resulting vulcanizates, and although it is beyond the scope of this article to evaluate all the commercially available softeners, there are several types which have been found satisfactory for use in compounding Butaprene N.

Where resistance to stiffening at low temperatures is of primary importance, ester-type softeners ordinarily are used. From 15 to 20 parts of an ester such as dibutyl sebacate or tributoxy-ethyl phosphate are sufficient to obtain freeze-resistance below —70° F. with Butaprene NF, and from 25 to 30 parts with Butaprene NL. Approximately 30 parts of such plasticizer are required to obtain freeze-resistance at —40° F. with Butaprene NXM in a 60 durometer compound, and approximately 4 parts additional plasticizer are required for each 10 points increase in durometer hardness. Figure 4 shows graphically the effects of several common softeners in Formula B using Butaprene NXM.

In cases where cold resistance is of secondary importance coal tar derivatives are satisfactory. Mixtures of ester and coal tar types are sometimes used to reduce the softener cost in a particular compound. Compounds having resistance to high aniline-point oils and heat have been developed with polyester type softeners, and where flame-resistance is needed the aliphatic and aromatic phosphates are useful.

A second major difference between natural rubber and butadiene-acrylonitrile type rubbers is the latter's lack of tack in the uncured state. This lack of tack is undesirable where calendering and building operations

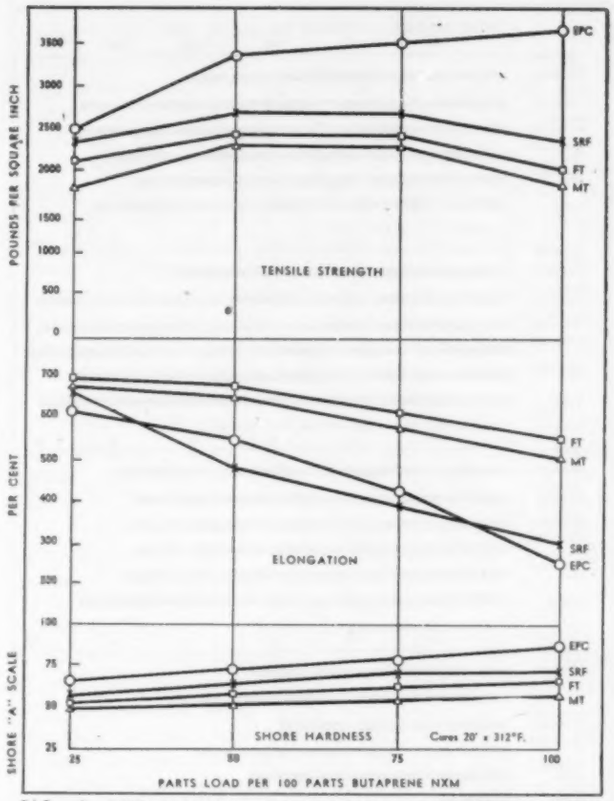


FIG. 2. THE EFFECTS OF LOADING BUTAPRENE NXM WITH VARIOUS CARBON BLACKS – FORMULA "A"

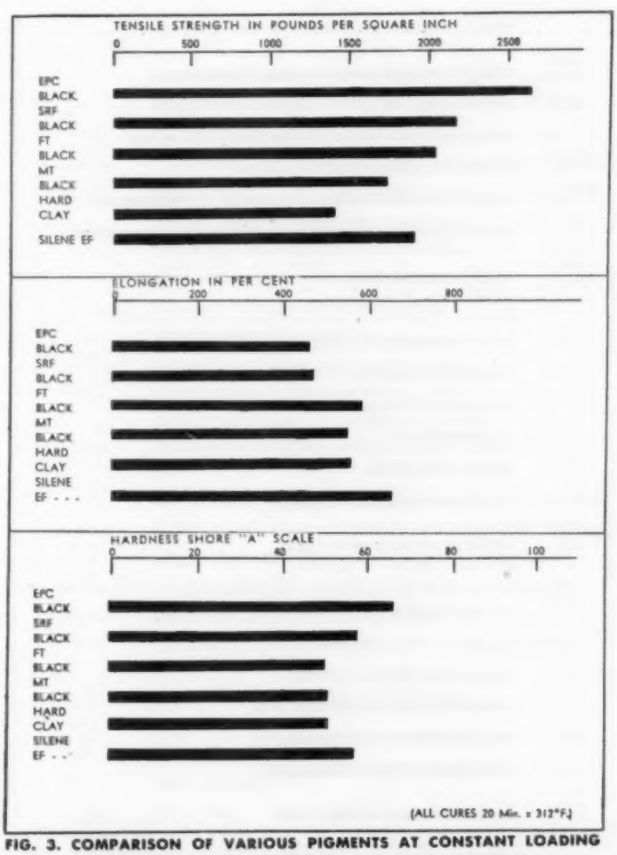


FIG. 3. COMPARISON OF VARIOUS PIGMENTS AT CONSTANT LOADING WITH BUTAPRENE NL – FORMULA "A" 50 PARTS LOAD

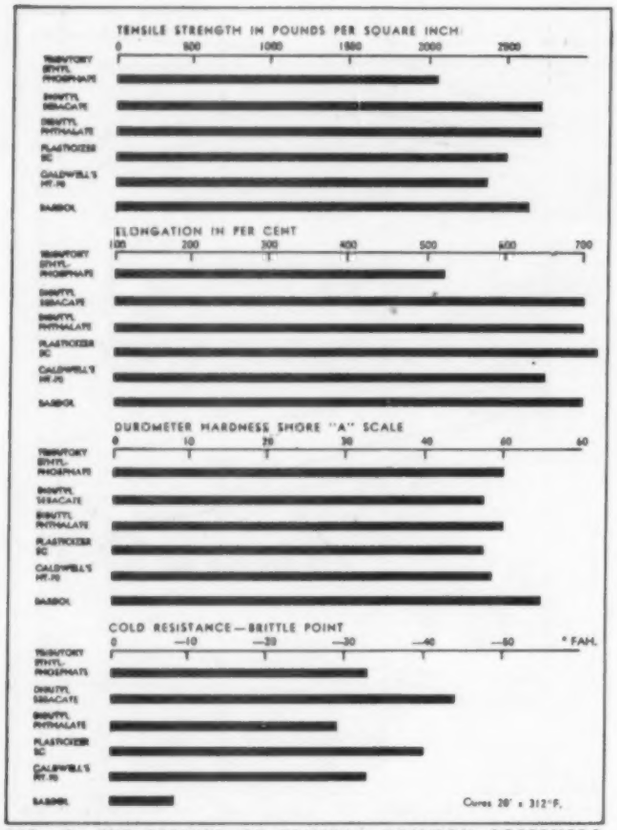
TENSILE STRENGTH IN POUNDS PER SQUARE INCH
0 500 1000 1500 2000 2500
ELONGATION IN PER CENT
100 200 300 400 500 600 700
DUROMETER HARDNESS SHORE "A" SCALE
0 10 20 30 40 50 60
COLD RESISTANCE—BRITTLE POINT
0 —10 —20 —30 —40 —50 °FAH.
Cures 20' x 312°F.

FIG. 4. THE EFFECTS OF SEVERAL COMMON SOFTENERS IN FORMULA "B" CONTAINING BUTAPRENE NXM

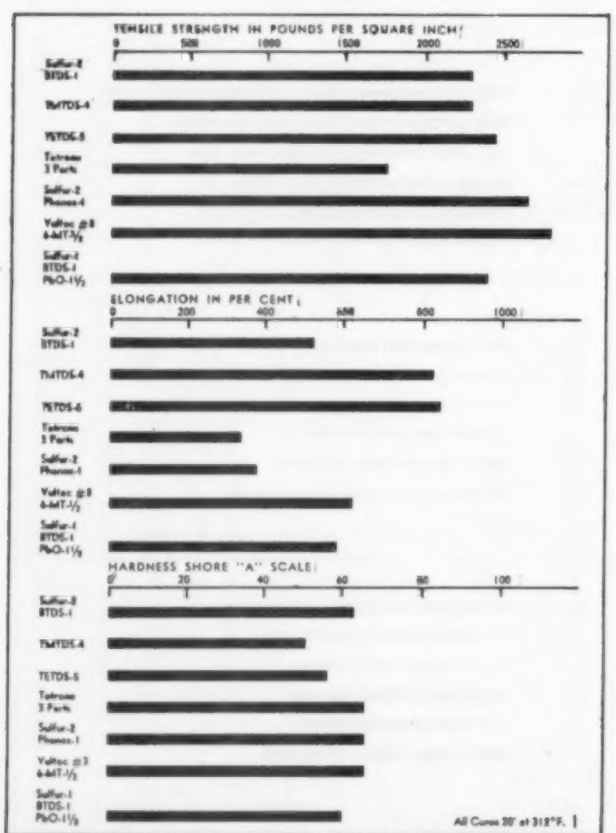
TENSILE STRENGTH IN POUNDS PER SQUARE INCH
0 500 1000 1500 2000 2500
ELONGATION IN PER CENT
0 200 400 600 800 1000
HARDNESS SHORE "A" SCALE
0 20 40 60 80 100
All Cures 20' at 312°F.

FIG. 5. A STUDY OF SEVERAL COMMON TYPES OF ACCELERATORS AND CURATIVES IN A BUTAPRENE NXM COMPOUND — FORMULA "C"

are necessary and may be overcome to some degree by the selection of proper plasticizer combinations or the addition of small amounts of reclaimed rubber, guayule, resins and the like where reduced oil- and cold-resistance can be tolerated. Certain types of phenolic resins, such as Bakelite 4036, recently have been found to impart excellent building tack to Butaprene N compounds.

Since Butaprene N contains an appreciable amount (2 per cent) of an effective antioxidant the addition of more antioxidant except for specific purposes is not necessary. The antioxidants recommended under "Specific Compounding" are those which enhance the resistance of Butaprene N to heat aging. In cases where resistance to weather, sunlight and ozone are needed the addition of two to three parts of refined paraffin wax has given satisfactory results.

## Use of Accelerators

In choosing an accelerator for Butaprene N it should be pointed out that, as with natural rubber, no one accelerator has been found to impart all the desired properties to a compound. It has been found by this laboratory and others that thiazole-type accelerators give the best physical properties consistent with satisfactory processing. Accordingly, benzothiazyl disulfide has been chosen as representative of this class for most of the compounds discussed in this article; however, data is presented also on a wide range of other accelerators and curatives with Butaprene NXM in Formula C, as shown in Figure 5. The low compression-set values which may be obtained on sulfurless cures with Butaprene NXM (Formula D) are especially noteworthy and are shown in Figure 6.

Butaprene N is compatible with natural rubber, GR-S, GR-M, reclaim, rubber substitutes, guayule, Thiokol, Vistanex and various polyvinyl and other resins, but not with GR-I. Satisfactory mixes of Butaprene N and GR-I have not as yet been made. The use of the aforementioned materials naturally gives an extremely wide range of possible formulas and properties which may have many specific applications. For example, the addition of GR-S to a Butaprene N compound will prevent shrinkage or volume decrease upon exposure to high aniline-point oils, which ordinarily shrink compounds of 100 per cent Butaprene N by extracting the plasticizer.

## Processing

In general it may be said that Butaprene N may be processed in all conventional rubber making equipment; *e.g.*, mills, internal mixers, calenders, tubers, etc. Proper and complete dispersion of the pigments plays a far greater role in Butaprene N compounding than it does in natural rubber and, consequently, the mixing technique must be correct in order to get the best possible dispersion of the pigments and fillers in the batch. This precaution is necessary to obtain the highest physical properties possible in the compound. Overheating is undesirable and it is advisable to mill small batches on a tighter and cooler mill than would be the practice with natural rubber. Premastication is important in preparing rubber to accept the pigments and fillers. Improper breakdown induces pigment ag-

TABLE I—MIXING SPECIFICATION FOR BUTAPRENE COMPOUNDS ON 6"x6"x16" LABORATORY MILL

| | Time |
|---|---|
| 1. Mill Speed—20 to 22 R.P.M. (Front roll) | |
| 2. Roll Ratio—1 to 1.5 | |
| 3. Mill Setting—Approximately .025" | |
| 4. Mill Temperature—Warm (120°-140° F.) | |
| 5. Procedure: | |
| a. Break down Butaprene | 0 to 2 min. |
| b. Add antioxidant | 2 to 5 min. |
| c. Add zinc oxide, accelerators, etc. | 5 to 8 min. |
| d. Add rest of pigments except sulfur | 8 to 9 min. |
| e. Add oil on top of pigments | |
| f. Allow to mix—open mill if necessary | 9 to 14 min. |
| g. Add sulfur | 14 to 16 min. |
| h. Roll 4 times end over end | 16 to 18 min. |
| i. Weigh—to check formula—slab out thin | |
| j. Allow slab to cool overnight | |
| k. Remill | 18 to 20 min. |
| l. Roll 4 times end over end | 20 to 22 min. |
| m. Sheet off .090" to .110" gage | 22 to 23 min. |

Note: Steps d, e and f may have to be varied as to time for high oil and black loadings. The total time may vary if steps d, e and f vary.

glomerates which are dispersed with difficulty if at all.

The order of adding the compounding ingredients as shown in Table I has been found to give good dispersion, ease of mixing and high reproducibility of results, and is a typical procedure for use on a conventional 6"x6"x16" laboratory mill. In adapting this procedure to the factory it is recommended that the amount of Butaprene N necessary to give a small rolling bank be determined and the compound then be designed to fit this amount of original polymer, thus avoiding mixing batches too large for the mill.

Butaprene N batches may be mixed in a Banbury mixer, provided the machine is tight and has adequate ram pressure. Batch sizes are chosen so that the amount of polymer is sufficient to cover the rotors and cause the ram to "ride" on the bank, and should be determined experimentally for each compound. Because of its toughness, Butaprene N generally produces compounds which develop more frictional heat, and consequently mix at higher temperatures, than natural rubber, and scorching may be encountered in some cases in the Banbury mixer. It is therefore important to maintain mixing cycles as short as possible, and a good procedure is to break down the Butaprene N alone in the Banbury mixer for from 3 to 5 minutes, after which the oils and pigments, except curatives, are added together. If channel black is present, it should be added *after* the other fillers and oils.

A roll or "leader" of hot stock from the previous batch is frequently added to accelerate the mixing. In this way the batch need be in the Banbury mixer only 8 to 10 minutes, after which it is transferred to a sheeting mill, where sulfur and accelerator are added and worked in, and sheeted off and cooled. The batch should be remilled the following day, and additional remilling is recommended wherever possible. It should be pointed out that Banbury-mixing frequently results in less complete dispersion of the pigments than mill-

TABLE II—FORMULAS FOR "ASTM SPECIFICATIONS FOR AUTOMOTIVE RUBBER COMPOUNDS (D735-43T)"

| Grade Suffix | SB410 ABEF | SB515 ABEF | SB612 ABEF | SB720 ABEF | SB810 ABEF | SB902 ABEF |
|---|---|---|---|---|---|---|
| Butaprene NXM | 80 | 85 | 75 | 60 | 75 | 75 |
| Butaprene NF | .. | .. | .. | 30 | .. | .. |
| GR-S | 20 | 15 | 25 | 10 | 25 | 25 |
| Tributoxyethyl Phosphate | 15 | .. | 15 | 10 | 15 | 15 |
| Dibutyl Phthalate | .. | 10 | .. | .. | 15 | .. |
| Dibutyl Sebacate | 15 | .. | 15 | 10 | .. | 15 |
| Bardol | .. | 10 | .. | .. | .. | .. |
| Zinc Oxide | 5 | 5 | 5 | 5 | 5 | 5 |
| Stearic Acid | 1 | 1 | 1 | 1 | 1 | 1 |
| Medium Thermal Black | 55 | .. | 30 | .. | .. | 350 |
| Fine Thermal Black | .. | .. | 25 | .. | 210 | .. |
| Semi-reinforcing Black | .. | 50 | 70 | .. | .. | .. |
| Easy-proc. Channel Black | .. | .. | .. | 100 | 40 | .. |
| Antioxidant * | 2 | 2 | 2 | 2 | 2 | 2 |
| Sulfur | 2 | 2 | 2 | .. | 2 | 2 |
| Benzothiazyl Disulfide | 1 | 1 | 1 | 1.5 | 1 | 1 |
| Tetrone A | .. | .. | .. | 1.5 | .. | .. |
| | 196 | 181 | 266 | 231 | 391 | 491 |
| Min. Cure at 312° F. | 20' | 30' | 20' | 20' | 20' | 30' |
| Original Tests | | | | | | |
| Tensile (psi.) | 1550 | 2050 | 1370 | 2650 | 1320 | 890 |
| Elongation (%) | 780 | 590 | 350 | 315 | 190 | 120 |
| Shore Durometer | 39 | 51 | 60 | 72 | 80 | 88 |
| Aged 70 Hours at 212° F. in Circulating Air Oven | | | | | | |
| Tensile Change (%) | +11 | + 3 | +12 | — 5 | 0 | +13 |
| Elong. Change (%) | —23 | —33 | —33 | —21 | —39 | —50 |
| Durometer Change | + 7 | +13 | +12 | + 7 | + 8 | + 5 |
| Aged 70 Hours at 212° F. in ASTM #3 Test Oil | | | | | | |
| Tensile Change (%) | — 2 | —16 | + 3 | — 4 | +18 | +15 |
| Elong. Change (%) | —22 | —26 | —23 | —17 | —29 | —17 |
| Durometer Change | + 4 | — 3 | — 6 | — 2 | 0 | — 4 |
| Volume Change (%) | + 3 | +13 | + 9.2 | + 3 | + 6.9 | + 5.3 |
| Cold Resistance—ASTM Bent Loop Test Conditioned 5 Hrs. at —40° F. | OK | OK | OK | OK | OK | OK |
| Compression Set—ASTM Method B—Aged 22 Hours at 158° F. Samples Cured 50' at 312° F. | | | | | | |
| % Set | 28 | 12 | 15 | 20 | 20 | 15 |

* Polymerized trimethyl dihydroquinoline type.

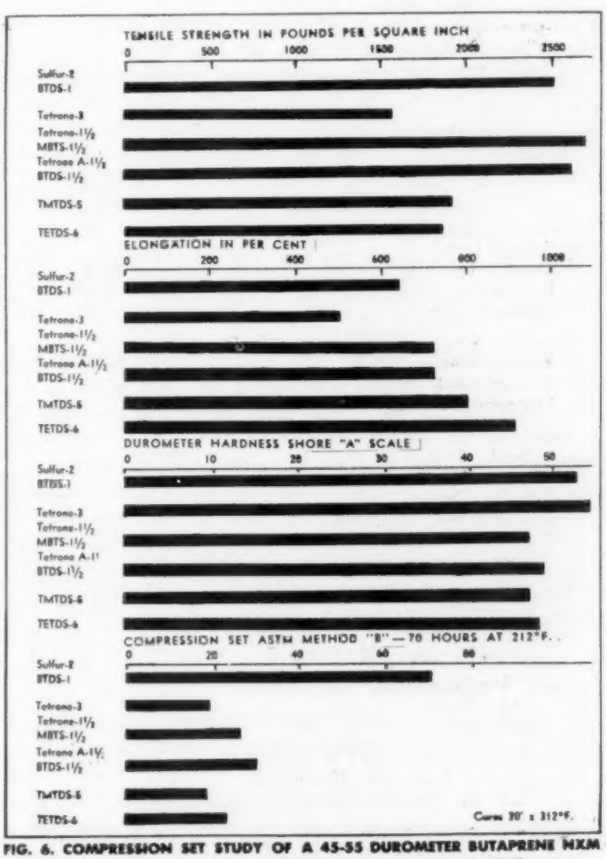


FIG. 6. COMPRESSION SET STUDY OF A 45-55 DUROMETER BUTAPRENE NXM STOCK — Sulfur vs. Sulfurless cures — Formula "D"

mixing, so that more remilling is necessary to secure satisfactory results in the final product. Other satisfactory procedures for Banbury-mixing are possible, and the most suitable method should be determined experimentally for each compound.

The extrusion of Butaprene N compounds is possible on all ordinary rubber extruding equipment. Tubing temperatures of about 200° F. are advisable for both the barrel and head. Proper choice of load and softener, as well as thorough polymer breakdown and pigment dispersion, is important in obtaining smooth tubing of a Butaprene N compound.

Compounds of Butaprene N may be processed on conventional calenders. It is suggested that a top roll temperature of approximately 150° F. be used with the two lower rolls about 15° F. cooler. Operation at odd roll speeds and slow linear speed is advisable to obtain calendered stock without blisters. Laminated stocks may be run provided the compound has sufficient building tack to cohere.

Compounds of Butaprene N are vulcanized in much the same manner as natural rubber. All types of curing equipment may be used with Butaprene NF, although in some cases more exacting preparations are necessary because of the inherent lack of tackiness of this type of material. It is definitely more important with Butaprene N compounds than with natural rubber compounds that complete pigment dispersion and thorough polymer breakdown be obtained, in order to secure satisfactory flow characteristics during molding. Surfaces to be cured together must not be contaminated with dust, soapstone, finger marks, mold dope or other foreign material if good "knitting" or "healing" is desired. Surfaces should be freshly cut if possible.

It is desirable in some cases to form the preparation to as near the same shape as the cavity as possible; however, any preparation which will permit uniform flow of the stock to the limits of the cavity, without trapping air, is satisfactory, the best size and shape being determined experimentally for each compound. It should be emphasized again that thorough breakdown and homogeneity of the compound are essential in securing proper flow during molding.

Molds for Butaprene N compounds follow the general design used for rubber, although in some cases transfer and injection type molds have been adapted to the molding of intricate shapes that tended to show flow lines in the conventional compression type mold. Compounds of Butaprene N may be vulcanized in any curing medium suitable for rubber; *e.g.*, steam, air, hot glycerine, superheated water, etc. Cured Butaprene N parts may be subjected to cutting, grinding and buffing in the same manner as parts made of rubber. Cured Butaprene N is not thermoplastic and cannot be reformed from cured materials as can some other synthetics in use today.

TABLE III—GASOLINE-RESISTANT BUTAPRENE COMPOUNDS

| | A | B |
|---|---|---|
| Butaprene NXM | 100 | 100 |
| Plasticizer SC | ... | 30 |
| Tributoxyethyl Phosphate | 8 | ... |
| Dibutyl Sebacate | 9 | ... |
| Zinc Oxide | 5 | 5 |
| Stearic Acid | 1 | 1 |
| Semi-reinforcing Black | 80.5 | ... |
| Easy-proc. Channel Black | ... | 80 |
| Fine Thermal Black | ... | 85 |
| Medium Thermal Black | ... | 25 |
| Sulfur | 1.5 | ... |
| Ethyl Tuads | ... | 5 |
| Benzothiazyl Disulfide | 1 | 1 |
| Antioxidant * | 2 | 2 |
| | 208 | 334 |
| Minutes Cure at 312° F. | 30′ | 20′ |
| Original Tests | | |
| Tensile (psi.) | 1970 | 1760 |
| Elongation (%) | 450 | 295 |
| Shore Durometer | 63 | 70 |
| Aged 70 Hours at 212° F. in Air Oven | | |
| Tensile Change (%) | + 5 | — 4 |
| Elongation Change (%) | —21 | —30 |
| Durometer Change | + 6 | + 7 |

| Immersed in ASTM Reference Fuel SR-6 at 80 ± 5° F. | A | | B | |
|---|---|---|---|---|
| Time in Hours | 24 | 168 | 24 | 168 |
| Tensile Change (%) | —13 | —10 | —15 | —24 |
| Elongation Change (%) | —51 | —55 | —11 | —15 |
| Durometer Change | —13 | —15 | —14 | — 9 |
| Volume Change (%) | +19 | +19 | + 9 | + 7 |
| Immersed in ASTM Reference Fuel SR-10 at 80 ± 5° F. | | | | |
| Time in Hours | 24 | | 24 | |
| Volume Change (%) | +2 | | 0 | |
| Cold Resistance—ASTM Bent Loop Test Conditioned 5 hrs. at —40° F. | OK | | OK | |
| Compression Set—ASTM Method B—Aged 70 Hours at 212° F. Samples Cured 50′ at 312° F. | | | | |
| % Set | 44 | | 26 | |

* Polymerized trimethyl dihydroquinoline type.

## Specific Compounding

The most valuable part of any article discussing the processing and compounding of a material is that portion dealing with the actual applications of the ideas presented and the results obtained in specific cases. Accordingly, it was felt desirable to present a number of compounds developed to meet specific and exacting requirements.

A series of Butaprene N compounds ranging in durometer from 40 to 90 is presented in Table II. These compounds are designed to meet certain typical specifications for synthetic rubber compounds of the SB grade as listed in the A.S.T.M. specifications *(1)* for automotive rubber compounds (D735-43T). No attempt has been made to meet every grade number as it is obvious that an immense number of combinations of suffix letters is possible. The compounds presented here are suggested as practical working formulas meeting the basic requirements, and also cold resistance, compression set, oven and oil aging as outlined in the tables. Only one compound for each durometer range is listed, but only slight modifications need be made in each durometer range to meet any grade desired by the manufacturer.

Two Butaprene N compounds designed to offer maximum resistance to gasoline are presented in Table III. Both compounds have been tested in A.S.T.M. reference fuels SR-6 and SR-10 *(2)* and are suggested for applications where the composition of the gasoline to which they may be subjected is unknown and variable.

Of more than passing interest to automotive engineers is information on the performance of Butaprene N when subjected to lubricating oils of various composition under severe temperature conditions. The compounds presented in Table IV were exposed to A.S.T.M. test oils #1 and #3 and to 97 per cent ethylene glycol for 70 hours at 300° F. and the degradation of properties after exposure are reported. These compounds appear to be satisfactory for service in hot lubricating oils under the most severe conditions. A further feature of this type of formulation is the very low compression-set results obtained.

Low compression-set after exposure to severe conditions of temperature and pressure has been found to be a very important property of Butaprene N. Compression-sets were measured on the compound shown in Table V after exposure for 70 hours at 212° F., 250° F. and 300° F. in a circulating air oven and the results as shown by the data are extremely low, which demonstrates that Butaprene N is satisfactory for applications where constant pressure sealing is necessary under extreme temperature conditions.

TABLE IV—HOT OIL-RESISTANT BUTAPRENE COMPOUNDS

| | A | B |
|---|---|---|
| Butaprene NL | 90 | ... |
| Butaprene NXM | ... | 60 |
| Butaprene NF | ... | 30 |
| GR-S | 10 | 10 |
| Paraplex G-25 | 10 | 10 |
| Plasticizer SC | 5 | 5 |
| Zinc Oxide | 5 | 5 |
| Antioxidant * | 2 | 2 |
| Semi-reinforcing Black | 100 | 100 |
| Benzothiazyl Disulfide | 1.25 | 1.25 |
| Tetrone A | 1.25 | 1.25 |
| | 224.50 | 224.50 |
| Minutes Cure at 312° F. | 20 | 20 |
| Original Tests | | |
| Tensile (psi.) | 2090 | 2150 |
| Elongation (%) | 285 | 330 |
| Shore Durometer | 68 | 65 |
| Aged 70 Hours at 212° F. in Air Oven | | |
| Tensile Change (%) | — 5 | — 9 |
| Elongation Change (%) | —28 | —26 |
| Durometer Change | + 4 | + 1 |
| Aged 70 Hours at 300° F. in ASTM #3 Test Oil | | |
| Tensile Change (%) | —41 | —53 |
| Elongation Change (%) | —30 | —33 |
| Durometer Change | —18 | —20 |
| Volume Change (%) | +23 | +23 |
| Aged 70 Hours at 300° F. in ASTM #1 Test Oil | | |
| Tensile Change (%) | —25 | —22 |
| Elongation Change (%) | —40 | —32 |
| Durometer Change | + 6 | + 1 |
| Volume Change (%) | — 0.5 | + 0.3 |
| Aged 70 Hours at 300° F. in 97% Ethylene Glycol | | |
| Tensile Change (%) | — 5 | — 6 |
| Elongation Change (%) | —25 | —11 |
| Durometer Change | +1 | — 5 |
| Volume Change (%) | + 3.7 | + 3.4 |
| Cold Resistance—ASTM Bent Loop Test Conditioned 5 hrs. at —40° F. | OK | OK |
| Compression Set—ASTM Method B—Aged 70 Hours at 250° F. Samples Cured 30′ at 312° F. % Set | 26 | 21 |

* Polymerized trimethyl dihydroquinoline type.

TABLE V—BUTAPRENE COMPOUND RESISTANT TO COMPRESSION-SET AT HIGH TEMPERATURES

| | |
|---|---|
| Butaprene NXM | 100 |
| Tributoxyethyl Phosphate | 20 |
| Dibutyl Sebacate | 20 |
| Easy-proc. Channel Black | 25 |
| Semi-reinforcing Black | 25 |
| Antioxidant * | 2 |
| Zinc Oxide | 5 |
| Benzothiazyl Disulfide | 1.5 |
| Tetrone | 1.5 |
| | 200.0 |
| Minutes Cure at 312° F. | 20 |
| Original Tests | |
| Tensile (psi.) | 1215 |
| Elongation (%) | 460 |
| Shore Durometer | 40 |
| Minutes Cure at 312° F. | 30 |
| Compression Set—ASTM Method B | |
| Aging Conditions | % Set |
| 70 hrs. at 212° F. | 20 |
| 70 hrs. at 250° F. | 28 |
| 70 hrs. at 300° F. | 40 |

* Polymerized trimethyl dihydroquinoline type.

## Summary


Three types of Butaprene N are now being commercially produced, namely, type NXM, type NL and type NF. These cover a wide range in oil-resistance and cold-resistance, type NXM being most oil-resistant and type NF most cold-resistant, with type NL intermediate in properties.

All types of Butaprene N are compounded with sulfur, accelerator, metallic oxide and fatty acid in a manner similar to natural rubber. In contrast to natural rubber, however, they require plasticizers in considerable quantity to facilitate processing, and a loading of reinforcing filler, preferably carbon black, in order to attain commercially practical physical properties.

Formulas and test data are presented illustrating how the Butaprene N elastomers may be used, alone or in combination with each other or with GR-S, to produce compounds having excellent resistance to stiffening at low temperatures, as well as to deterioration after exposure to gasolines and lubricating oils of varying composition at various temperatures. In addition, formulas and test data are included showing how the Butaprene N elastomers may be compounded to secure extremely low compression-set after prolonged deformation at high temperatures, a valuable property for all types of pressure sealing devices.


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# Synthesis of Rubber in Kok-Saghyz Roots During Starvation

By J. McGAVACK and P. J. FAULKS

*Research and Technical Development Department, General Laboratories, United States Rubber Co., Passaic, N. J.*

EXAMINATION of the formation of rubber in various plants under different circumstances has led to the hypothesis that synthesis of rubber proceeds continuously in the living plant, but that rate of formation varies greatly with the environment of the plant. It is conceivable that rubber breakdown may proceed along with synthesis. Under no known conditions of rubber breakdown, however, is rubber decomposed unit by unit; there is probably random breaking of the rubber molecules with the production of substances soluble in such solvents as acetone or methyl alcohol.

Divergent evidence pertinent to the hypothesis exists in the literature. Mazanko *(1)* produced evidence to show that the rubber in kok-saghyz roots (Taraxacum Kok-saghyz) stored in darkness decreases with time, and suggested that rubber is broken down and respired. Neiman and Dobrovolskaia *(2)*, however, produced evidence to show that rubber accumulates in kok-saghyz roots stored in darkness and suggested that rubber is broken down only if the roots become rotten.

Spence and McCallum *(3)* have shown that in guayule (Parthenium argentatum) the weight of rubber per plant decreases under various treatments. The nature of the residual rubber recovered was, however, not described.

*Authors John McGavack (right) and P. J. Faulks removing kok-saghyz roots from frozen soil at Paramus, N. J., in December, 1942.*

The present paper describes some experimental work which was undertaken to provide evidence for the support or otherwise of the hypothesis of continuous rubber production.

It was required to determine whether there is any change in the absolute amount of rubber in plants during starvation. Trials were made on two methods:

1. The growing of Cryptostegia grandiflora plants in sunlight in a carbon dioxide free atmosphere.
2. The storage of kok-saghyz roots in darkness.

In the first method, groups of 27 potted Cryptostegia plants were divided into three subgroups of nine plants and submitted to the following treatments:

A. Killed immediately and dried.

B. Kept in a stream of normal air and sunlight for about two weeks, then killed and dried.

C. Kept in a stream of carbon-dioxide free air in sunlight for about two weeks (when very rapid defoliation occurred), then killed and dried. (There was no apparent change in the latex of the plants as a result of this treatment).

The dried plants were ground and analyzed for rubber by solvent extraction in Soxhlet's apparatus. The results are shown in Table I.

Statistical analysis showed that differences between weights of toluene extracts attributable to treatments were insignificant because of the high standard error. The carbon dioxide starvation method was rejected because of the difficulty of obtaining large enough amounts of plant material for accurate analysis. Furthermore, the toluene extracts were non-rubbery.

In the second method, kok-saghyz roots were dug, washed, cleaned, and weighed and planted in pots in clean sand. The pots were held at three different temperatures, and samples were removed at 0, 1, 2 and 3

TABLE I—CRYPTOSTEGIA CARBON DIOXIDE STARVATION EXPERIMENT

| *Treatment* | *Average weight of toluene extract recovered from subgroups of 9 Cryptostegia plants (mg.)** |
|---|---|
| (A) Killed at beginning | 41 |
| (B) Kept in normal air | 46 |
| (C) Kept in carbon dioxide free air | 49 |

* Means of 5 runs.

*Representative collection of rubber-bearing plants in the greenhouse: (1) Redilanthus; (2) Taraxacum—kok-saghyz; (3) Hevea; (4) Euphorbia; (5) Chelidonium; (6) Jatropha—chilte; (7) Asclepias syriaca; (8) Cryptostegia grandiflora; (9) Solidago; (10) Ficus elastica.*

weeks. The sample roots were washed, blanched, dried, ground, and analyzed for rubber by solvent extraction in Soxhlet's apparatus. These results are shown in Table II.

Statistical analysis showed that differences between weights of toluene extracts attributable to treatments were insignificant because of the high standard error (which was due largely to the great reduction by rotting of the number of roots per sample).

The kok-saghyz storage method was, however, considered suitable if the following conditions were observed: Only good, healthy roots are to be used; all roots which become rotten must be rigidly excluded. Temperature of storage is not to be too high, otherwise excessive root rotting occurs. Sufficient roots are to be taken in each sample to eliminate differences between roots. Adequate solvent extraction of the dried ground roots is to be allowed; 72 hours extraction with acetone followed by 72 hours with toluene in Soxhlet's apparatus is suitable.

In the final experiment 800 kok-saghyz roots were selected. Each one was thoroughly cleaned, washed, weighed and planted in clean sand in an earthenware pot.

The pots were then allotted to four groups for different dates for removal and analysis of the roots, placed in frames on a greenhouse bench, and covered so as to exclude light but permit ventilation. The plants were watered when necessary. The temperature was kept at 45-55° F. The plants belonging to the four groups were arranged in the frames in such a way as to eliminate any effects between groups attributable to position in the frame.

After each sample was removed the remaining pots were moved so as to fill the gaps and so tend to keep the conditions unchanged inside the frame.

After removal from the frame, the plants of each sample group were sorted and rotten roots were rejected. So far as could be determined, rotting occurred at random. The remaining roots were thoroughly washed, blanched, dried at moderate temperature, weighed, and kept under carbon dioxide in the dark until the end of the experiment so that analysis of the roots of all groups could be carried out at the same time.

## Percentage of Rotted Roots

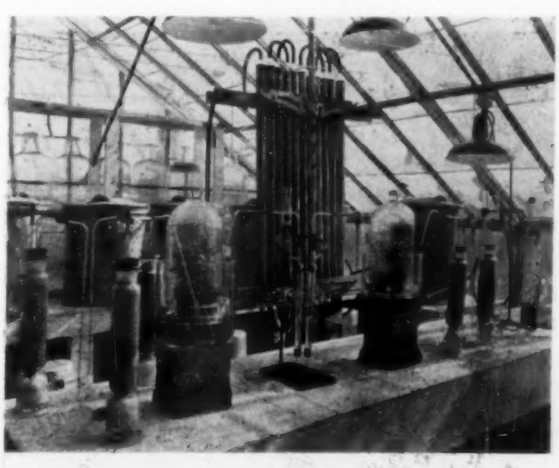
The sampling dates were chosen to provide the maximum duration of storage. When the last sample was taken, 67% of the roots in it had rotted and the new leaves which had sprouted from the crowns of healthy roots were dying.

The dried roots were spongy and could be easily crushed whereas the dried roots at the beginning of the experiment were hard and brittle. This indicates that the food reserves of the root were exhausted and that the root cells were beginning to separate.

At the end of the experiment the roots of each

TABLE II—KOK-SAGHYZ PRELIMINARY STORAGE EXPERIMENT

| *Treatment* | *Average weight of toluene extract × 100 / Original fresh weight of roots* |
|---|---|
| Stored 0 week | 2.26 |
| Stored 1 week | 2.18 |
| Stored 2 weeks | 2.28 |
| Stored 3 weeks | 2.09 |
| Temperature of storage 40° F. | 2.18 |
| Temperature of storage 50° F. | 2.28 |
| Temperature of storage 70° F. | 2.15 |



*Apparatus used at the greenhouse for cryptostegia starvation experiments. Carbon dioxide free air is applied to the left hand bell jar by passing air through the soda towers (in the middle of the picture) and normal air is supplied to the right hand bell jar. Compressed air is supplied to the constant pressure device at the left, is humidified in the glass towers, and escapes through the flow equalizer at the middle.*

group were ground in a Wiley mill with a 20 mesh screen, and twelve 4-gram samples were taken from each group. Each sample was extracted in a Soxhlet apparatus for 72 hours with acetone followed by 72 hours with toluene. Table III summarizes the experimental results.

Analysis of variance of the individual determinations of the amount of rubber recoverable from 200 roots (% toluene extract on dry weight x dry weight of 200 roots of the appropriate group) showed differences between these amounts to be significant at the 99:1 probability level.

The difference in the amount of recoverable rubber per group between any two groups necessary for significance at the 19:1 probability level is 1.8 gm.

The rubber recovered from each group of roots was very tough and elastic.

Synthesis of rubber probably occurred during storage. Any breakdown that may have occurred was not sufficient obviously to alter the physical properties of the rubber.

## Rubber Is Formed Continuously

This conclusion agrees with the hypothesis that rubber is formed continuously in the living plant. It will be noted that the ratio of weight of rubber formed (assuming no breakdown) to weight of dry material lost, is small.

With regard to the conditions necessary for the production of the most rapid synthesis of rubber, various work has been reported.

The heavy tapping of hevea trees can divert metabolism towards rubber formation in such a way as to cause cessation of increase in trunk girth. Recent work on guayule *(4)* has indicated that low night temperature may greatly increase rubber formation compared with high night temperature. Russian work *(5, 6)* has indicated that the presence in the plant of radioactive elements and the products of ultra-violet irradiation of leaves may favor rubber formation. Correlation of these results and extension by further experimentation is desirable.

*View of eight months old kok-saghyz plants in the greenhouse maintained at Paramus, N. J., by the U. S. Rubber Co.*

TABLE III—KOK-SAGHYZ ROOT STORAGE EXPERIMENT

| *Group* | *Period of storage (days)* | *Fresh wt. per 200 roots at the beginning (gm.)* | *Dry wt. per 200 roots at sampling (gm.)* | *Wt. of Acet. Extr. recoverable from 200 roots (gm.)* | *Wt. of rubber (toluene extr.) recoverable from 200 roots (gm.)* |
|---|---|---|---|---|---|
| 1 | 0 | 2020 | 397 | 14.7 | 19.75 |
| 2 | 29 | 2020 | 359 | 16.8 | 22.00 |
| 3 | 57 | 2020 | 338 | 31.6 | 23.90 |
| 4 | 72 | 2020 | 316 | 27.6 | 22.70 |

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# GR-S Latex

## A Review of Its Development, Types Available, Properties, and Some Problems of Application

By F. S. CONOVER

*Naugatuck Chemical Division of United States Rubber Co., Naugatuck, Connecticut*

A detailed explanation of the qualities and uses of natural latex is hardly necessary in an article on the subject of GR-S latex, but a very short summation of the growth of this business up to the start of the recent great war may be of interest. In 1938, the United States imported 26,600,000 dry pounds of natural latex. The following year, 1939, the consumption had increased to 61,460,000 pounds and in 1940 it reached the enormous total of 73,315,000. Complete figures for 1941 are not available. These increases in consumption were due to two factors. One, of course, was the unparalleled demand for rubber products of every kind, both at home and abroad, and the other was the steady advance in technology and quality of the latex industry and latex products.

### Uses of Latex

Any complete list of the products made from natural latex is too long to be of interest here, but some of the important items are worth mentioning. Tire cord solutions and thin walled dipped goods, boots and shoes, combining cements (both wet and dry), curled hair and vegetable fibre cushionings, paper saturants, and beater process latex compounds, were among the most important applications, and it was natural that when GR-S latices finally appeared, these products came in for a major share of development compounding.

When war came, the supply of natural latex was one of the first of our imports to be cut off, but sufficient was in the country so that, combined with what continued to come in from Liberia, the most pressing needs could be at least partially filled.

When the GR-S program was undertaken, most of the emphasis was placed upon the development of a dry polymer. This was due to the imperative and overwhelming demand of the military (and the country at large) for tires. It soon became apparent, however, that a GR-S latex would have to be developed if the needs of the emergency were to be even partially satisfied.

GR-S latex is produced by the copolymerization of butadiene and styrene, by methods developed in government plants, under direction of Rubber Reserve Company. These hydrocarbons are introduced in the form of water soap emulsions into a reactor, and allowed to react under certain conditions of time, temperature and pressure until polymerization has been carried to the desired point. When the total solids reach specification, the reaction is considered complete, and after a stripping operation to remove excess unreacted hydrocarbons, the material is ready for use.

Type I was the first step in the development of a GR-S latex. It was a 75/25 GR-S which was not carried through to the dry polymer state. It was made on a fatty acid soap and contained an antioxidant which made it undesirable for a number of purposes.

Type II was a natural outgrowth of Type I. It was essentially the same product with the antioxidant omitted, since a more suitable one could be added during compounding.

Type III was the next step. Types I and II were deficient in tensile strength, especially in films which contained no reinforcing pigments, and since pigmenta-

Note: This article is based on a talk made by the author before the Detroit Rubber & Plastics Group, Inc., at Detroit, Mich., on September 13, 1945.

TABLE I—DIFFERENCES BETWEEN GR-S LATICES

| | Type I | Type II | Type III | X-160 |
|---|---|---|---|---|
| Butadiene | 75 | 75 | 50 | 50 |
| Styrene | 25 | 25 | 50 | 50 |
| Soap | Fatty Acid | Fatty Acid | Potassium Rosinate | Potassium Salt of Mod. Rosin with Special Stabilizers |
| Short-Stopper | No | No | No | Yes |
| Antioxidant | Yes | No | No | No |
| % Conversion | 77 | 77 | 85-90 | 85-90 |
| % Total Solids | 24-28 | 24-28 | 37-40 | 37-40 |
| pH | 8.5-10.5 | 8.5-10.5 | 9.5-11.5 | 9.5-11.5 |
| Viscosity | 5-10 | 5-10 | 8-10 | 3-8 |
| Mooney Viscosity | 45-55 | 45-55 | 75-90 | 75-90 |
| % Combined Styrene | 22.9-24.0 | 22.9-24.0 | 45.0-47.5 | 45.0-47.5 |
| Surface Tension (dynes/cm.) | 57.61 | 57.61 | 45-57 | 55-60 |
| Average Particle Size (mu) | 0.09 | 0.09 | 0.12 | 0.11 |
| Mechanical Stability | 30'+ | 30'+ | 30'+ | 30'+ |

tion is objectionable for many latex uses, a polymer with improved strength was a necessity. The polymer ratio was therefore changed from 75 butadiene/25 styrene to 50 butadiene/50 styrene. This improvement, as well as other improvements described in this paper, was developed in the government plants, owned by Reconstruction Finance Corporation and operated under the direction of Rubber Reserve Company. Type III is made on potassium rosinate and contains no antioxidant. It is carried to a somewhat higher conversion than Types I and II. Its most apparent deficiency (since overcome) was a tendency to flocculate on further handling, such as concentrating or compounding.

## Type X-160 Developed

X-160 was developed because of the previously mentioned flocculating tendencies of Type III. Instead of potassium rosinate, it is made on a modified rosin and contains a short-stopper but no antioxidant. It was superior to the early runs of Type III in applications where floc was objectionable, but could never entirely replace it because the processing of some products required the soaps used for Type III. There is at present a strong trend back to the former product. The short-stopper was used in X-160 in order, as the term implies, to prevent further polymerization after the completion of the polymerization cycle. The desirability of this procedure is still an open question. Table I shows the differences between Types I, II, III and X-160.

Having shown the main differences in the four types of latices in most common use, it will be profitable to consider some of the more fundamental concepts. The question naturally arises, "How did the 50/50 butadiene/styrene ratio come to be used?" Partial answers are shown in Figure 1.

This diagram is not intended to be exact, it shows trends and directional changes. The manufacture of a useful and suitable copolymer latex can be compared to rubber compounding. It represents that compromise or series of compromises which will most nearly approach the desired result. No compounder has yet been successful in developing one stock which in itself will satisfy all the demands of rubber goods, or will even approach universality. Fortunately, each product is the result of some need which can be satisfied only by suitable variations of compounding.

## Development of Special Latices

Up to now, a copolymer combination had of necessity to represent the product which was most useful to the largest number of people, and which would most easily fit into the largest number of uses, especially at times when production facilities and research and development equipment and personnel were strained to the utmost. This picture is rapidly changing, however, and the time is now here when particular latices are being, and will be, developed to meet specific needs, since butadiene/styrene ratios can be altered to give various effects and properties.

Returning to Figure 1, it is apparent that a 50/50 copolymer offers a fairly close approach to the most generally useful latex. It represents a compromise between the physical properties listed, which while not the best in any one attribute, is nevertheless useable and useful.

Further differences between Types I, II, III and X-160 are brought out in Figure 2. These curves indicate that whereas Types I and II have very low tensiles, they can be strongly reinforced with carbon black, and (but to a very limited extent) with clay. In the dry state, these copolymers are completely unsuitable because of these low initial physical properties, that must be reinforced. In latex form, pigmentation or reinforcement is very often extremely undesirable for a number of reasons—color, appearance and modulus being three important ones.

The Type III and X-160 latices, however, need no reinforcement to have reasonably good physical properties. Whether carbon black does any good at all is open to question, but the use of small amounts of clay is apparently beneficial in applications where clay can be tolerated.

These two latices have, therefore, formed the basis for most compounding work. Many useful products have been made from them, all however, subject to the fundamental characteristics which have been discussed. It is undeniable that natural latex is superior in many respects, yet it is equally true that these butadiene/styrene copolymers have proven advantageous in some applications, and that further work will inevitably result in more and more useful information. The synthetic products can be altered and controlled, whereas the natural latex to a large extent cannot.

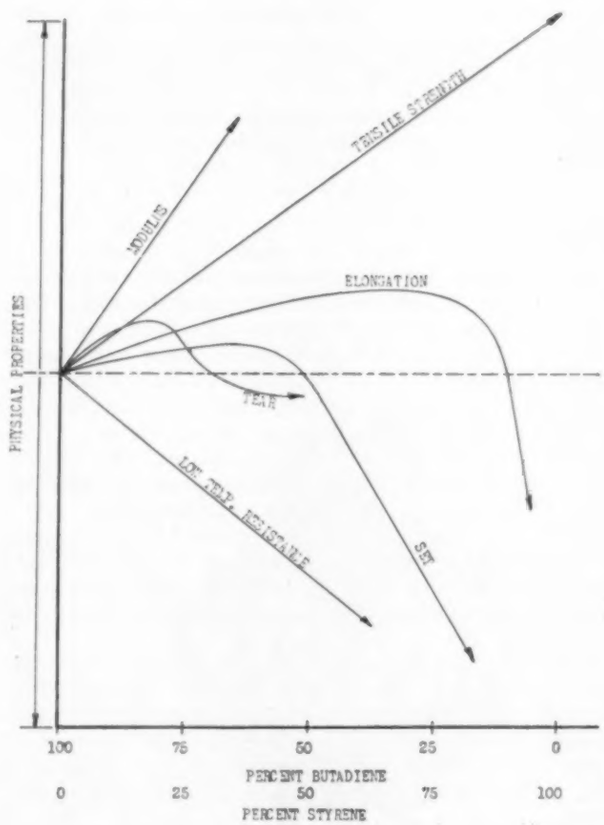



*FIG. 1.*

The effects of alterations in monomer ratios have already been discussed. The effects of changes in particle size can now be considered. Particle size may have any or all of five major effects. It is known to exert strong influence on: (1) Stability, (2) Foaming, (3) Gelation on cooling, (4) Concentration by creaming, and (5) Rate of drying.

*Stability:* Since the surface of a sphere varies as the square of the radius, and since natural latex has an average particle diameter of 0.25 micron while Type III or X-160 have average particle diameters of 0.10 micron, it becomes apparent that the synthetic products which we now have will require enormously greater amounts of stabilizing agents or soaps than the natural product if the same stability is to be maintained. This is a disadvantage since large amounts of soap tend to produce weaker films and to increase water absorption. Intensive work is under way to overcome these difficulties and considerable progress has already been made.

*Foaming:* Foaming is almost a corollary of the above. It follows that if a system contains large amounts of soap, anything which disturbs the soap-particle interface will tend to free the soap and cause foaming. The answer to this will be worked out with that of stability.

*Gelation:* At 40° F., GR-S latices thicken and become unuseable. This is commonly thought of as freezing, but actually is only the thickening and subsequent immobility of the excess soap. Slow warming restores the latex to its former state and, provided actual freezing of the liquid phase has not taken place, the latex is still in good and uniform condition and can be used.

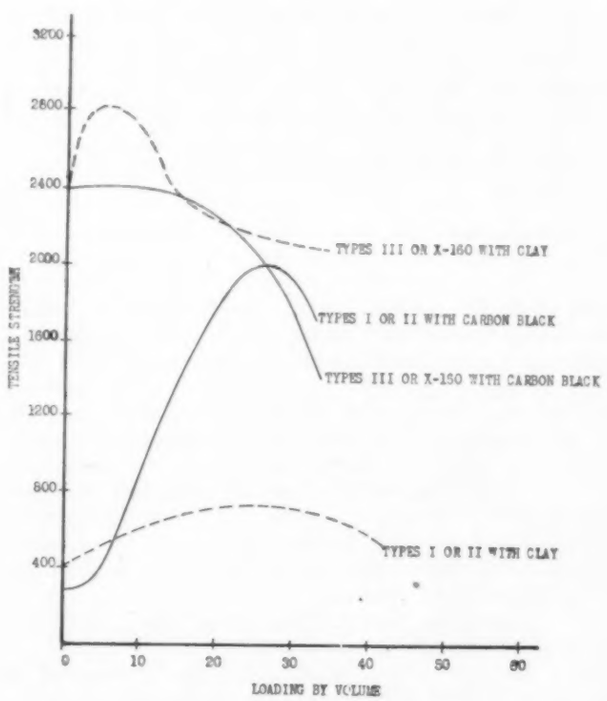



*FIG. 2.*

*Concentration:* The small particle size latices present some creaming difficulties not encountered with the normal product. This is due to two factors, one the specific gravity and the other the loss of particle mobility due to excess soap. The specific gravity is a little difficult to overcome, but the other factor can be mastered in two ways, either by a change in the characteristics and quantity of soap used or by effectively increasing particle size. Much development is under way along both avenues of approach.

There are, of course, methods of concentrating GR-S latices other than by creaming. Evaporation and centrifugation are common methods and combinations of any two or all three might be advantageous depending on the equipment available and the necessary characteristics of the concentrate. Except for special purposes, however, the most natural and economical place to concentrate GR-S polymers would seem to be right in the reactor in which it is made. This is now being done experimentally with every prospect for success.

*Drying:* The drying rate of films depends to some extent upon the size of the latex particle. The larger the particle, the faster the drying. In applications where quick drying is advantageous, it will be possible to regulate this factor by a choice of latices of the proper particle diameters. This will provide a flexibility heretofore unobtainable.

## Advantages of Small Particle Size Latices

Lest the small particle size of present GR-S latices be considered an unmitigated evil, it should be mentioned here that this very attribute is in some cases a distinct advantage. Paper impregnation, yarn impregnation, and the shrink-resistance processes for woolen and cotton fabrics and yarns, take full advantage of this fact. In any application which depends on saturation of a material by latex, the small particle size should offer advantages.

Where high film strength is required natural rubber latex is superior to GR-S latex in its present form. There is no real reason, however, for this to remain true. Research and development have already improved the product. More and more of the factors controlling the quality and usefulness of synthetic latices are becoming known and new means of controlling and taking advantage of them are constantly being uncovered.

Partial answers have already been found to: (1) Considerations of particle size, (2) Amounts and types of soaps, (3) Control of polymerization, (4) Reaction times and temperatures, and (5) Type and amount of monomers. Every bit of information and data obtained provides another tool with which to work, and the time is rapidly approaching when more complete answers will bring their inevitable reward in better and better products.

There still remains a vast opportunity in hitherto relatively untouched fields. Butadiene and styrene are not necessarily the best monomers. Others will undoubtedly be found which will do a better job, and it is a strong probability that terpolymer systems or even systems embracing four or more monomers will prove advantageous.

The tree has been at this business for thousands of years. Research, given opportunity and time, must surely find the correct answers.

# *First Report on German War Tires*

# Summary Report on the Production and Performance of German Synthetic Tires and Other Transportation Items

## Part IV—Conclusion

**This concluding portion of the "Summary Report on the Production and Performance of German Synthetic Tires" is devoted to a general survey of the German rubber industry. Submitted by one of the members of the rubber mission to Europe, it is an excellent report on the conditions of the German industry during the war years. The information was obtained through a series of interviews with a former high official of the German Rubber Control Group and from the examination of many reports and documents bearing on the subject.**

### Summary of Information on German Rubber Industry

1. By 1940, Germany had made herself reasonably independent in regard to all materials needed for the manufacture of rubber products with the exception of natural rubber.

2. The production of synthetic rubber in Germany was 40,500 tons in 1940 and increased to a maximum of 115,000 tons in 1943. (Metric tons—2204 pounds—used throughout this report).

3. When production first started in quantity, synthetic was priced to German industry at 4 marks per kilo; early in the war the price was reduced to 2.7 marks per kilo. In 1943 the price was reduced to 2.3 marks per kilo, where it remained.

4. Of the three principal raw materials needed for manufacture of rubber end-products, rubber, carbon black, and fabric rubber was always in the shortest supply position; production of carbon black and rayon fabric was more than adequate.

5. A total of 75,000 tons of natural rubber reached Germany during the war, the last sizable shipment being 4,000 tons in January, 1943. From January 1, 1943, to the present no more than 8,000 to 10,000 tons of natural rubber reached Germany.

6. The present stocks of synthetic and natural rubber were estimated at 5,000 to 6,000 tons of synthetic and 2,000 to 3,000 tons of natural rubber. The present stock of carbon black was estimated at 3,000 tons. It was felt in the absence of figures that the stocks of rayon fabric were good.

7. In 1943, 120,000 tons of rubber were processed in Germany. During the past year or so, most plants suffered more or less severely from bombing. If all undamaged plants or parts of plants now available were put to work, they would require rubber at the rate of 48,520 tons per year, which figure is broken down as follows: 3,000 tons natural rubber, 32,360 tons synthetic rubber, and 13,160 tons reclaim.

8. It was estimated that the nine leading German rubber manufacturers processed 83,500 tons, or 70% of all rubber, in 1944, and that Continental processed 36,000 tons, or 30% of the total.

9. It was estimated that available undamaged carbon black facilities had capacity to produce 23,000 tons per year which would provide an excess of approximately 7,000 tons above the requirement to process the above quantity of rubber.

10. Productive facilities for rayon fabric were felt to be in excess of the requirement.

11. The maximum number of tires produced in Germany during 1944 were built in August when the total was 254,691. From that point on production declined steadily to a figure of 80,901 in February, 1945.

12. The German organization for controlling rubber supply, allocation, manufacture, and distribution, was the Reichstelle-Kautschuk, which was tied in closely to the Ministry of Economics.

13. The German organization for controlling industry standardization, technical developments, and specifications, was the Fachgruppe, which was tied into an overall industry group known as the Reichsgruppe.

14. By 1937, the prices of at least 70% of all German rubber products were under the control of cartels.

15. The capacity of German industry to manufacture tires and tubes dropped at least 30% due to conversion to synthetic. This was partially offset by the creation of additional facilities.

16. During the period 1938-1942 the value of tires and tubes dropped from approximately 350 million to 270 million marks per year whereas the value of mechanical goods increased from 350 million to 600 million marks per year.

17. Prewar bicycle tire production in Germany was approximately 2,000,000 tires per month. During the war it averaged around 800,000 per month and early in 1945 dropped to less than 500,000 per month.

## Production of Synthetic Rubber

Production figures for Buna rubbers, obtained from two different sources, showed the following:

| *Year* | *Tons* |
|---|---|
| 1938 | 5,000 |
| 1939 | 14,000 |
| 1940 | 40,500 |
| 1941 | 68,000 |
| 1942 | 96,000 |
| 1943 | 115,000 |
| 1944 | 101,000 |

The production ticket for Buna for 1944 was set at 153,000 tons. The actual production was almost two thirds of the planned amount.

Following is a table which gives actual production figures for the German synthetic rubber industry for 1943 and 1944. It also gives the schedule of production which was set up for 1944. It was a very ambitious schedule. The drop in production during the latter half of 1944 was a direct reflection of the success of the strategic bombing of German industry. There was no concentrated bombing of synthetic rubber plants, but plants providing essential materials (particularly the refineries) to the synthetic plants were bombed heavily. The only serious bombing of a synthetic plant took place at Huls in June, 1943. The drop in synthetic production for the third quarter of 1943 was a direct reflection of this bombing.

| | *Actual 1943 Production Tons* | *Planned 1944 Production Tons* | *Actual 1944 Production Tons* |
|---|---|---|---|
| January | 9,380 | 11,750 | 11,540 |
| February | 9,350 | 11,750 | 11,200 |
| March | 10,340 | 11,750 | 12,700 |
| April | 10,010 | 12,050 | 11,480 |
| May | 10,630 | 12,050 | 8,880 |
| June | 9,300 | 12,050 | 10,600 |
| July | 6,830 | 13,050 | 10,040 |
| August | 8,170 | 13,050 | 6,030 |
| September | 8,080 | 13,050 | 5,280 |
| October | 10,090 | 14,040 | 5,700 |
| November | 11,030 | 14,040 | 5,570 |
| December | 11,490 | 14,040 | 1,775 |
| | 114,700 | 152,670 | 100,795 |

It was stated that all through the war, Germany struggled to attain an inventory position of 25,000 tons of rubber (synthetic and natural). That figure was attained after many difficulties in the middle of 194-, but then, due to the strategic bombing, synthetic production fell off rapidly. In the first half of 1944, 66,400 tons of Buna were produced. In the latter half production was only 34,395 tons.

At the present time, it was estimated that German synthetic rubber stocks totalled 5,000 to 6,000 tons, most of which was in the hands of the processors.

## Pricing of Synthetic Rubber to Industry

Information obtained indicated that during the early production of Buna rubber (presumably 1938 and 1939) it was allocated to the consumer by the Reichstelle-Kautschuk and that the consumer paid 4 marks per kilo. Presumably in 1940, the price was reduced to 2.7 marks per kilo, and in 1943 was reduced further to 2.3 marks per kilo. It was stated that discussions had been held regarding a further reduction in price to less than 2 marks per kilo but such a reduction had not yet been finalized. It was felt that the price had been set by agreement between the German Government and I. G. Farben allowing I. G. Farben to write off its investment at an accelerated rate.

It was intimated that Buna S could (after the period of accelerated depreciation was completed) be sold to industry for 1.6 to 1.7 marks and still be profitable to I. G. Farben.

## Wartime Natural Rubber Supply

According to the figures available, about 75,000 tons of crude rubber reached Germany during the war. During 1939, 1940 and part of 1941, much of the natural rubber reached Germany by rail through Russia. After Germany invaded Russia, it all came by boat. The last large shipment totalling 4,000 tons arrived in January, 1943, when the natural rubber stockpile was down to 500 tons. Since that time, only small quantities have come in, largely by submarine. It was estimated that a total of not more than 8,000 to 10,000 tons of natural rubber reached Germany from January 1, 1943, on to the end of the war.

Originally, all German dealings for natural rubber were with the Netherlands and France. After Japan took over the rubber-producing areas in the East, the Japanese tried to control the entire crude rubber market. It was insisted that the French rubber production from Indo-China be sold to Japan at a price considerably less than Germany had been paying for it. Japan proposed to sell it to Germany at a price higher than that previously paid to France. Since both France and Germany stood to lose by such an arrangement, they successfully resisted Japanese pressure. Germany did deal with the Japanese to a certain extent but it was no more than absolutely necessary.

An estimate of the use of natural rubber in Germany for the last third of 1939, and forward through 1944 (assuming a consumption of 3,000 tons for 1944), totalled 102,500 tons. If 75,000 tons was imported during the war and the current inventory is 2,000 to 3,000 tons, a stockpile in 1939 of approximately 25,000 tons would be indicated. Such a figure would hardly represent more than normal inventory since Germany's rubber consumption of natural rubber in 1938 was 97,000 tons. The table below shows natural rubber

usages by year compared with consumption of synthetic and reclaim in "metric tons."

| | Natural | Reclaim | Buna — In Germany | Buna — In Occupied Europe | Total |
|---|---|---|---|---|---|
| 1938 | 97,000 | 29,000 | 5,000 | — | 131,000 |
| 1939 | 61,000 | 34,000 | 14,000 | — | 109,000 |
| 1940 | 27,000 | 46,000 | 40,500 | — | 113,500 |
| 1941 | 22,000 | 46,000 | 51,500 | 16,500 | 129,500 |
| 1942 | 26,500 | 40,000 | 70,000 | 26,000 | 136,500 |
| 1943 | 4,000 | 50,000 | 90,000 | 25,000 | 144,000 |

## Present State of Rubber Industry

In 1943, Germany reached her peak production of rubber goods, processing 144,000 tons. Of this total, 14,000 tons was processed in Austria, 5,000 tons in Czecho-Slovakia, and 5,000 tons in Poland, or 24,000 tons outside of Germany proper. The remainder, 120,000 tons, was processed in Germany. Of this total, 70% or 83,500 tons was processed by the nine leading German firms as follows:

| Company | Tons |
|---|---|
| Continental | 36,000 |
| Dunlop | 11,000 |
| Phoenix | 5,500 |
| Deka | 7,500 |
| Metzler | 5,500 |
| Fulda | 8,000 |
| Englebert | 3,500 |
| Veigth | 3,000 |
| Vorwerk | 3,500 |
| Total | 83,500 |

It was estimated that due to bombings or other causes, these firms were today only 45% effective and hence could process only 37,570 tons per year. It was further estimated that the nine large companies could process 27,250 tons per year of tires and tubes (40% of the 1943 capacity) and 10,320 tons of mechanical goods (69% of the 1943 capacity).

In addition to the above nine firms, there were some 10 to 20 companies processing from 100 to 200 tons of rubber per month, and approximately 80 companies processing 40 to 100 tons per month. There were perhaps 200 very small companies. The total consumption of rubber for these companies was estimated to be 36,500 tons in 1943. It was felt that these companies would be today no more than 30% effective and hence could process only 10,950 tons per year. It was assumed that this entire group were mechanical goods manufacturers. The total mechanical goods which could be currently processed was 10,950 tons, plus 10,320 for the nine large firms, totalling 21,270 tons.

To complete the estimate, certain assumptions regarding use of reclaim and natural rubber were made with the following results showing the amounts of rubber required if the total available productive capacity of the German rubber industry was to be utilized:

| | Tires and Tubes | Mech. Goods | Total |
|---|---|---|---|
| Natural rubber (tons) | 2,450 | 550 | 3,000 |
| Synthetic rubber (tons) | 22,000 | 10,360 | 32,360 |
| Reclaim (tons) | 2,800 | 10,360 | 13,160 |
| Total | 27,250 | 21,270 | 48,520 |

For a complete breakdown of the above figures, see Table XIV.

## Supply of Carbon Black

According to figures supplied, German carbon black production reached its peak in 1943 when 57,694 tons were produced, of which 41,781 tons were used in Germany and 12,348 tons outside Germany. In 1943, 120,000 tons of rubber were processed in Germany proper. Thus the usage of carbon black was of the order of one pound of black for every three pounds of rubber. On this basis the requirement of carbon black to take care of existing rubber stocks in Germany (estimated to be 9,000 tons) would be 3,000 tons, which was said to be the total amount of black remaining in Germany as of May 1, 1945.

It was further estimated that there was sufficient carbon black capacity undamaged to permit the production of 23,000 tons of black per year. The requirement of black, should all available rubber processing plants resume operation, would be about 16,000 tons per year.

TABLE XIV—GERMAN RUBBER CONSUMPTION

(Note: This table gives an estimate of German rubber consumption in 1943 by the nine major companies. They used 70% of the total rubber consumed. It shows an estimate of the split between tires and tubes and mechanical goods, the remaining undamaged capacity of the plants for tires and tubes and mechanical goods, and finally the amount of rubber each plant could hope to process under present conditions.)

| | Total Rubber Processed 1943—Tons | Percentage used for Tires & Tubes | Percentage used for Mech. Goods | Tons of Rubber — Tires and Tubes | Tons of Rubber — Mech. Goods | % of Productive Capacity Undamaged & Available — Tires and Tubes | % of Productive Capacity Undamaged & Available — Mech. Goods | Tons of Capacity Available — Tires and Tubes | Tons of Capacity Available — Mech. Goods | Total Tons Rubber Processing Capacity Currently Available |
|---|---|---|---|---|---|---|---|---|---|---|
| Continental | 36,000 | 75 | 25 | 27,000 | 9,000 | 50 | 80 | 13,500 | 7,200 | 20,700 |
| Dunlop | 11,000 | 100 | — | 11,000 | — | 40 | — | 4,400 | — | 4,400 |
| Phoenix | 5,500 | 67 | 33 | 3,700 | 1,800 | 70 | 69 | 2,590 | 1,080 | 3,670 |
| Deka | 7,500 | 100 | — | 7,500 | — | — | — | — | — | — |
| Metzler | 5,500 | 67 | 33 | 3,700 | 1,800 | 80 | 80 | 2,960 | 1,440 | 4,400 |
| Fulda | 8,000 | 100 | — | 8,000 | — | — | — | — | — | — |
| Englebert | 3,500 | 100 | — | 3,500 | — | 40 | — | 1,400 | — | 1,400 |
| Veith | 3,000 | 80 | 20 | 2,400 | 600 | 100 | 100 | 2,400 | 600 | 3,000 |
| Vorwerk | 3,500 | 50 | 50 | 1,750 | 1,750 | — | — | — | — | — |
| Total | 83,500 | — | — | 68,580 | 14,950 | — | — | 27,250 | 10,320 | 37,570 |

Assuming the estimate of 23,000 tons to be correct, if the carbon black units were put into operation, there would be excess black for export.

CARBON BLACK IN TONS

| | Year | Gas | Acetylene | Lampblack | Total |
|---|---|---|---|---|---|
| Production | 1942 | 26,986 | 9,646 | 12,837 | 49,489 |
| | 1943 | 28,439 | 14,007 | 15,228 | 57,674 |
| | 1944(est.) | 17,000 | 10,500 | 13,000 | 40,500 |
| Home Consumption | 1942 | 19,918 | 6,330 | 11,489 | 37,744 |
| | 1943 | 17,790 | 10,642 | 13,349 | 41,781 |
| | 1944(est.) | 15,000 | 9,000 | 14,000 | 35,000 |
| Foreign Consumption | 1942 | 8,228 | 2,644 | 2,571 | 13,443 |
| | 1943 | 7,916 | 2,966 | 1,466 | 12,348 |
| | 1944(est.) | 4,000 | 1,500 | 700 | 6,200 |
| Actual Stocks May 1 | 1944 | 1,500 | 1,000 | 500 | 3,000 |
| Within the territory occupied by British, American and French forces. | | | | | |
| Actual Capacity May 1 | 1944 | 10,000 | 5,000 | 8,000 | 23,000 |

## Supply of Other Materials

It was the opinion that there were adequate stocks of all other materials needed with the possible exception of Koresin. It was claimed that stocks of rayon fabrics were plentiful and that the rayon plants had not been hard hit, but there were no figures to substantiate these views. The same held for other compounding ingredients such as accelerators, antioxidants, etc. —that stocks were good and that in general the plants producing them had not been knocked out.

It was the writer's opinion that in regard to black and the above materials, the difficulties were probably minimized. It was hoped that these materials were readily available as indicated. There was some doubt in the writer's mind on the subject.

## Production of Tires

The table below shows the production of tires in Germany from January, 1944, through February, 1945. It should be noted that production declined steadily after August, 1944, presumably as a result of the strategic bombing of German Industry.

PRODUCTION OF TIRES

| 1944 | Motorcycle | Passenger | Truck | Airplane | Total |
|---|---|---|---|---|---|
| January | 18,440 | 54,698 | 109,511 | 40,017 | 222,666 |
| February | 15,203 | 56,833 | 115,185 | 42,190 | 229,411 |
| March | 12,014 | 66,726 | 125,002 | 49,061 | 252,803 |
| April | 10,961 | 54,794 | 115,646 | 43,770 | 225,171 |
| May | 10,867 | 61,332 | 125,007 | 46,865 | 244,061 |
| June | 13,563 | 60,050 | 128,673 | 51,872 | 254,158 |
| July | 11,029 | 62,186 | 129,246 | 42,539 | 245,000 |
| August | 12,959 | 59,496 | 142,911 | 39,325 | 254,691 |
| September | 11,314 | 39,534 | 119,579 | 40,705 | 211,132 |
| October | 6,440 | 27,953 | 104,018 | 36,464 | 174,875 |
| November | 5,776 | 23,783 | 89,830 | 26,050 | 145,439 |
| December | 5,581 | 22,917 | 76,840 | 23,436 | 128,774 |
| *1945* | | | | | |
| January | 3,870 | 13,688 | 52,064 | 14,266 | 83,888 |
| February | 3,666 | 17,300 | 35,055 | 20,880 | 80,901 |

For the first eight months of 1944 production was good with a minimum of 222,666 in January and a maximum of 254,691 in August. The average for the eight months was 240,995. There was a definite break in production after August, the last four months showing an average production of 165,055. The average for the first two months of 1945 was 82,395 tires per month. Based on these figures, the bombing of German industry was really felt during the Fall of 1944. This was due to the knocking out of certain factories, the disruption of communications so that material supply was uncertain, and the dislocation of labor due to the bombing of cities.

During the first eight months of 1944, tire production was split as follows:

| | |
|---|---|
| Motorcycle Tires | 5.4% |
| Passenger Car Tires | 24.7% |
| Truck Tires | 51.4% |
| Airplane Tires | 18.5% |

The Deka and Fulda tire plants were completely knocked out during the period September 1, 1944, to April 1, 1945. It was estimated that during the same period Continental and Dunlop were reduced to 50% and 40%, respectively, of their tire production capacity.

## The Reichstelle-Kautschuk

The Reichstelle-Kautschuk was brought into existence in 1934 by the German Ministry of Economics. It was an administrative body, the policy decisions being made by the Ministry of Economics. Originally the functions of the Reichstelle were:

1. To control import and export of rubber and carbon black.
2. To allocate rubber for specific uses—so much for tires and tubes, so much for mechanical goods.
3. To cooperate with the Ministry of Economics and Ministry of Finance to control the buying of rubber and other ingredients essential to rubber manufacture.

On the outbreak of the war in 1939, the responsibilities and powers of the Reichstelle were broadened along the following lines:

1. Regulations went into effect limiting the use of tires and other rubber products.
2. Retreading and repair of tires was brought under rigid control.
3. Marketing of all rubber, gathering and reclaiming of rubber and fabric were put under Government control.
4. Monthly production tickets and allocation of rubber and carbon black were brought under Government control.

All these controls were administered by the Reichstelle-Kautschuk.

During the first years of the war, the rubber manufacturers (through their industry group, the "Fachgruppe") obtained their supplies of rubber and carbon black through the Reichstelle-Kautschuk but had to deal with other Reichstelle for fabric and the general line of rubber chemicals. This procedure proved so cumbersome that in 1943 the Reichstelle-Kautschuk was empowered to deal with the other Reichstelle. This resulted in a balanced allocation of rubber and all other required materials from the Reichstelle-Kautschuk to the manufacturers.

During the last 1½ to 2 years of the war, the Reichstelle found that more and more of its time was consumed trying to provide adequate supplies of coal, utilities, and labor for the various manufacturers. It also was much concerned with transportation to ship materials from one factory to another. This was due to the strategic bombing which seriously affected all the items mentioned above.

By the middle of 1944, in an effort to get the most production possible from the rubber industry, a tendency developed to delegate to the Fachgruppe the allocation of rubber and other raw materials, the setting

up of production tickets, and the handling of all technical problems. As this tendency developed the importance of the Reichstelle-Kautschuk in the German rubber picture began to decline.

### The "Fachgruppe"

In the 1920's, the German rubber manufacturers formed a voluntary association which was the German equivalent of the Rubber Manufacturers Association in the United States. During the 1930's, the growth of the rubber cartels and the above industry group were closely associated. In 1934 membership in this German rubber association was made compulsory by the Government. In 1937, the name Fachgruppe was given to the association, and at the same time the rubber cartels became an entirely separate organization. At the head of the Fachgruppe were a President and a General Manager who were responsible to an industry board of ten to twelve men who acted as a Board of Directors. The Fachgruppe concerned itself primarily with the following:

1. Prices which were not cartelized.
2. General technical problems such as use of synthetic rubber and standardization.
3. Development of a standard costing system for the industry.
4. Advice of the Reichstelle-Kautschuk in regard to technical matters and general industry problems.

The Fachgruppe was made compulsory to provide the Government with a means of dealing with the rubber industry. It was one of the early signs of regimentation in Germany. The Government was opposed to cartels and hoped to control the cartels through the Fachgruppe. Instead, the rubber cartels severed all connection with the Fachgruppe.

At the head of all German industry groups was the Reichgruppe, under which were approximately 30 Wertschaftsgruppe, each responsible for a certain section of Germany's industry. Under each Wertschaftsgruppe were some 20 to 30 Fachgruppe, which in turn were subdivided into Unterfachgruppe to handle special items within an industry.

To a large extent, the interest of the Wertschaftsgruppe was concentrated in finance. Each company paid certain sums of money to the Wertschaftsgruppe on a predetermined basis. Certain firms were paid sums by the Wertschaftsgruppe to encourage their manufacture of products for export, thus subsidizing export at general industry expense.

At the beginning of the war, the Reichstelle dominated the Fachgruppe in the rubber industry and generally supervised its activities. The importance of the Fachgruppe and the cartels diminished as the responsibilities of the Reichstelle were broadened. The Fachgruppe was used primarily in an advisory capacity on certain problems such as:

1. Pricing and distribution of products.
2. Establishment of specifications.
3. Development of use of synthetic.

As mentioned, by the half of 1944 emphasis was swinging from the Reichstelle to the Fachgruppe. The following duties were taken over by the Fachgruppe:

1. Standardization of products.
2. Specifications for products.
3. Control of capacity and expansion, rebuilding of damaged factories, exchange of technical information. These were made the responsibility of the Production Committee of the Fachgruppe.
4. Switching of scheduling of tires and other products to Production Committee was planned but not completed.
5. Allocation of rubber and other raw materials to the individual factories after receiving overall allocation from the Reichstelle.

### The Rubber Cartels

Little specific information was gained regarding the organization of German rubber cartels. Their principal growth was during the 1930's. It was stated that by 1937, 70% of all German rubber products were controlled by the cartels. The principal products which were not cartelized were hard rubber and molded goods.

The cartels were stated to be voluntary organizations formed by groups of manufacturers. Often the procedure was for several of the smaller manufacturers to band together to control price. If the cartel was to be a success, the cooperation of Continental was essential. If Continental joined the group, the cartel was successful; if not, there was no cartel, for price control without Continental's agreement was in most cases impossible.

The name of the German tire cartel was Wikraga, a contraction of Wirtschaftstelle Der Krafahrzeug Reifen Fabriken. The mechanical goods cartel was called Witeka-Kautschukwaren Fabriken.

### Coordination of Demand with Output

In setting up its monthly schedules for production of rubber products, the Reichstelle had to consider two main groups—tires and tubes and mechanical goods. It first consolidated and approved the demands as forwarded to it by the various ordering agencies, then took steps to place the business. For tires and tubes, the following were the agencies:

1. The Okwehrmachtreifenstelle, the army agency which ordered the replacement tires and tubes for all the military, army, navy, and air force.
2. The automobile Wertschaftsgruppe, which ordered the tires and tubes required as original equipment on new vehicles other than military.
3. The Heereswaffenamt, the army ordnance agency which ordered the original equipment tires and tubes needed for military vehicles.
4. The Reichreifenlage, the agency set up by the Reichstelle to handle ordering and distribution of replacement tires and tubes for civilian purposes.
5. Export requirements reached the Reichstelle through the representatives of the various governments —Denmark, Norway, Rumania, etc.

Once the requirements were at hand and approved, the Reichstelle called a meeting to allocate the production among the various companies. Representatives of each of the manufacturers attended this meeting. At a round table meeting, each manufacturer took what he could; if there was a conflict between manufacturers, an attempt was made to adjust the difference. If the total requirements exceeded the amount the companies felt was obtainable, a subsequent meeting was held with the ordering agencies to adjust the requirements. Allocations were then made and orders placed.

For all mechanical goods, the military requirements were handled by allocation of rubber direct from the

Reichstelle to the Okwehrmachtreifenstelle, which in turn allocated it to the various companies in accordance with their ability to produce. Later, certain articles using little rubber were manufactured by the companies on order from the Okwehrmachtreifenstelle without reference to the Reichstelle. To obtain replacement rubber, the companies were required to certify the amount used and state the nature of the product. The products consuming large quantities of rubber continued to require allocation from the Reichstelle to the Okwehrmachtreifenstelle. The assignment of the rubber to the companies by the Okwehrmachtreifenstelle took place only after consultation with an engineer representing the Fachgruppe.

The civilian requirement for mechanical goods was handled by the Reichstelle. Allocations were made in the form of so much rubber to each manufacturer for each line of rubber goods being produced. It was left to the manufacturer to decide what sizes were to be produced.

## Control of Distribution of Products

In setting up its control of rubber products, the German Government set up direct control of tires and tubes. This was done by the following procedure: In order to drive an automobile, a civilian had to obtain a permit from the local police. This was granted only if suitable evidence was presented that the use of the automobile was essential. The mileage driven was controlled by the amount of gasoline or wood issued.

When tires wore out, the owner of the automobile was required to have his tires inspected by an official dealer, of whom there were 2,000 in Germany. This was the total number of tire dealers in Germany and had been reduced from a pre-war figure of 20,000. If the tire could not be repaired or retreaded, the dealer had to sign a certificate of necessity for a new tire. The certificate and the owner's tire card were sent to the Area Economics Officer and then to the Provincial Economics Office for approval. When approved, a new tire was made available through the Reichreifenlage but the tire card was not returned until the old tire was turned in. Tubes were obtained through the same procedure.

Old tires went to reclaimers but only after thorough inspection to see if some could not be made usable. About 40,000 per month went into the making of "boots" for tires and some were used to make soles for footwear.

It should be noted that civilian tires and tubes could be obtained only through the Reichreifenlage, which in effect were Government warehouses under the direct control of the Reichstelle. The dealers obtained tires for their customers from the Reichreifenlage, of which there were 37 in greater Germany. These warehouses were operated for the Reichstelle by the various rubber companies. For instance, in Hamburg the Reichreifenlage was operated by Phoenix. Each Reichreifenlage had a quota of so many tires and tubes per month. The quota was set by the Reichstelle.

There was no control over the distribution of mechanical goods. The amount of mechanical goods was limited by the general restrictions on rubber goods. The output of mechanical goods was distributed through normal channels.

Replacement tires and tubes for military use and mechanical goods for military use were delivered direct from the manufacturer to the proper military agency.

## Conversion from Natural to Synthetic

The conversion of German Industry to the use of approximately 100% synthetic rubber was not a serious problem until 1943. In each of 1940, 1941 and 1942, in excess of 20,000 tons of natural rubber were used. These figures represented 20 to 25% of the total rubber used in Germany. By the end of 1942, the natural rubber inventory was extremely low (an estimated 500 tons). The blockade had become so tight that relatively little rubber was getting through.

The result was that only 4,000 tons of natural rubber was reported to have been used in 1943, which was a little less than 3% of the total. Thus, the big conversion from natural rubber to synthetic took place in 1943, even though the Government did not make the use of 100% synthetic mandatory until the middle of 1944. After making the use of synthetic mandatory, certain exceptions were made where natural rubber was proven to be necessary. In 1945 use of natural rubber increased due to shortage of synthetic.

In converting to synthetic, there was considerable opposition from the industry. It was stated that tire production capacity dropped at least 30% when high percentages of synthetic were used. At the present time it was felt that most manufacturers would not use more than 50% synthetic in tires and tubes through choice and that some would go back to 100% natural rubber if possible. I. G. Farben was actively combating this trend by publicizing results of tests showing synthetic products to be superior to those of natural rubber.

## Production of Bicycle Tires

Prewar Germany had approximately 20,000,000 bicycles. This number probably increased during the war. At the present time, cycle tires are badly worn and large numbers of replacements were urgently required.

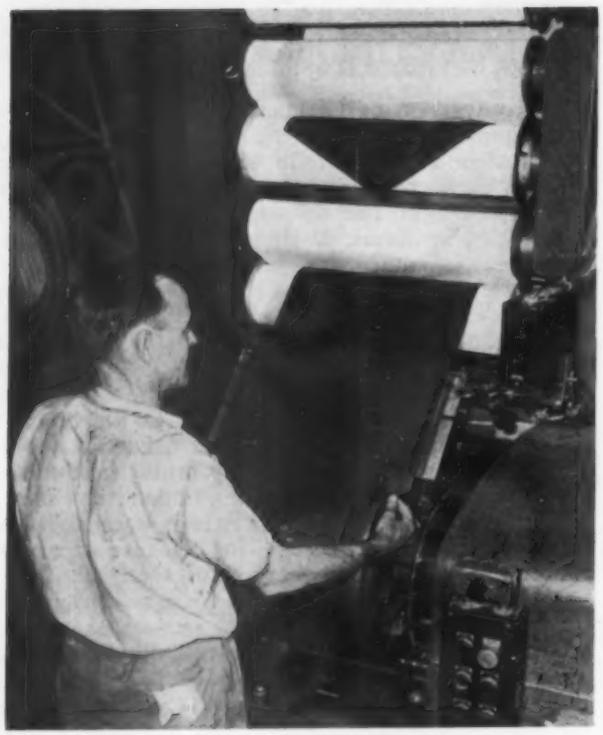
Prewar, as many as 2,000,000 cycle tires per month and approximately 1,500,000 cycle tubes per month were produced. During the war, the average was around 800,000 tires and 600,000 tubes per month. By 1945, production of cycle tires had dropped to 500,000 per month or less.

It was felt that lack of labor contributed largely to the drop in production to such a low level. This view was confirmed by the table which follows. It gives actual production of bicycle tires during the third quarter of 1943 compared with production capacity.

| *Company* | *Monthly Production 3rd Quarter 1943* | *Monthly Production Capacity 3rd Quarter 1943* |
|---|---|---|
| Continental | 450,000 | 620,000 |
| Dunlop | 150,000 | 218,000 |
| Englebert | 35,000 | 100,000 |
| Phoenix | 42,000 | 85,000 |
| Semperit (Austria) | 112,000 | 175,000 |
| Veith | 90,000 | 247,000 |
| Alemania | 3,000 | 12,500 |
| Hess, Peter | 5,600 | 38,500 |
| Odenwald | — | 44,000 |
| Hutchinson | — | 20,000 |
| | 888,100 | 1,560,000 |

*(Continued on page 246)*

# General Tire Co's New



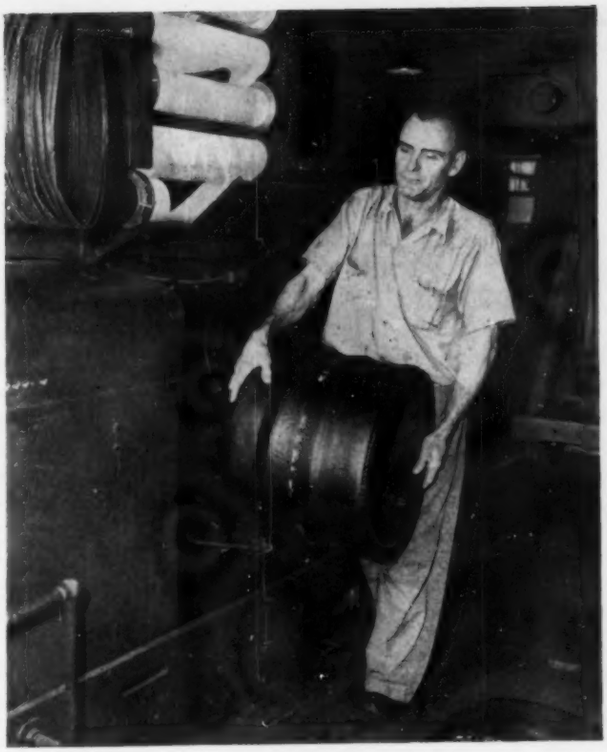
1 (Above)—The plies of the fabric are fed on to the cylinder of the new automatic tire building machine from spools. In this view, the operator is adjusting the first ply. The machine requires three persons—the operator and two assistants—to keep the flow of material coming smoothly.

2 (Above, right)—The tire is built around a steel cylinder that rotates by pushing a button. In this view, the operator is pushing the button at the right which starts the cylinder rotating, placing the ply smoothly in position.

3 (Right)—Here the fabric is being torn on a bias. Only during this operation, placing the beads on the cylinder, cutting the breaker strip, and placing the tread in place, does the operator touch the tire before removing it ready for the curing operation.

# Tire Building Machine

ILLUSTRATED on these two pages are operations of a new automatic machine, invented by Walter Breth of the Development Department of the General Tire & Rubber Co., Akron, Ohio, which is capable of turning out a new passenger car tire every two minutes, ready for curing. With a claimed production rate nearly twice that of any other semi-automatic machine in the industry, and five times that of hand-made tire methods, the new machine is capable of turning out 720 popular 6.00 x 16 passenger tires in a 24-hour period. General Tire claims it eliminates the necessity for human skill, reduces the percentage of rejects, and produces a more perfect tire. Five of the machines are already in operation at the company's plant in Akron.



**6 (Right)—Here is one of the finished tires ready for the curing room. The new automatic tire building machine is capable of producing one of these tires every two minutes, or 720 tires per day. Advantages claimed for the machine include the elimination of the necessity for human skill, fewer rejects, and better tires.**

**5 (Below, right)—The final step consists of feeding the tread stock into the cylinder. As this illustration indicates, the tread stock is fed into the cylinder by the rollers in the foreground. This is one of the four operations during which the operator touches the tire, for positioning purposes.**

**4 (Below)—When the four plies are in place (in the case of four-ply passenger tires) the ends are forced up around the beads. Some of the details of this phase of the operation of the automatic tire building machine can be seen in this close-up view.**

# Editorials . . . . . .

## Conference Communique

THE communique issued by delegates of the Rubber Study Group attending a four-power conference on rubber in London this month could have been written long before the conference was actually held. It revealed nothing that was not already well known and made no reference to any program for the future. It covered the same ground that the communique issued at Washington earlier this year did. It would be interesting to learn what arguments were presented at the conference by the accredited delegates with regard to the future price structure of rubber and control of rubber production—natural and synthetic—the major aspects of the entire rubber problem.

In a sense the communique issued was what should have been expected, since the Rubber Study Group was formed solely for "exploratory" purposes, the governments involved not being bound by any decisions reached by the group. In another sense, no commitment of any kind could be made by the American delegation in view of the fact that we have not as yet formulated any definite national policy on rubber. The formulation of such a policy, which includes a decision on the amount of synthetic rubber to be produced annually as a security measure, and how much plant capacity shall be retained for stand-by purposes, lies in the hands of the Inter-Agency Policy Committee on Rubber recently formed by the Office of War Mobilization and Reconversion. This committee has not yet presented its conclusions to Reconversion Director John W. Snyder.

The conference at London, which started on November 20, was attended by delegates from the United States, Great Britain, the Netherlands, and France. It was the first conference held by the group at which French delegates were present, the invitation to attend having been extended shortly before the London meeting got under way. In view of the fact that more rubber ready for shipment was found in French Indo China than there was in Malaya the invitation for the French to attend was in keeping with good business procedure.

According to the communique, the study group is agreed that a great rubber surplus will be existant within the next two or three years. It is estimated that whereas world requirement may amount to as much as 1,500,000 tons annually for the next few years, production may easily total 2,900,000 tons, consisting of 1,400,000 tons of synthetic rubber and 1,500,000 tons of natural rubber. This is a fact which is recognized throughout the rubber producing and consuming industries, both of which recognize that production control of some kind is essential if chaos is to be avoided. Although no reference to any such production control was made by the study group, there can be no doubt that it was discussed and it is regrettable that no indication of the discussion was contained in the one and only communique issued.

The communique did make one point which is indicative of the trend some of the discussions must have taken at the meeting. It stated that "information showed that plant manufacturing costs in the United States have declined markedly in the recent past and are more than covered by the present selling price of 18½ cents per pound for general purpose synthetic." This would indicate that it is already possible to operate some of the synthetic rubber plants at a profit when the selling price is 18½ cents per pound and since the trend of production costs is still downward, it is quite possible that the ceiling price of the synthetic product may be lowered shortly. Should the selling price of government synthetic drop as low as 15 cents a pound, the natural product, with all of its advantages, will have tough sledding at 25 cents a pound, a mark British and Dutch interests seem to be aiming at.

The weakness of the communique is of course attributable to the fact that the rubber study group is confined to "exploratory" talks. But since the problems of demand and supply are so clearly defined, we again urge that a definite world-wide policy on rubber be determined at the earliest possible date, even if the surplus problem may not arrive for two or three years. It is far better to know what regulations may apply to production and consumption in the future than to try and guess where the industry stands.

## Price of Rubber

TO all intents and purposes, the British are holding out for a price of 36 Straits cents a pound for natural rubber. Translated into American exchange, this means 17 cents, or approximately 25 cents a pound for natural rubber laid down in New York. One British rubber expert is on record with the statement that American rubber manufacturers will gladly pay this price for rubber. That may be true at the moment, but it brings up the old question as to actual plantation costs and profits. Undoubtedly it will cost the British and Dutch more money to produce rubber for a while, but once conditions are righted, what then should the selling price be? John L. Collyer, president of the B. F. Goodrich Co., recommends "the earliest possible establishment of a Far East price of around 12 cents or less a pound." He holds that such a price would assure efficient rubber growers a reasonable advantage in the face of competition with low-cost synthetic rubber, as well as a reasonable return on their plantation investments. Mr. Collyer knows rubber, but it is extremely doubtful whether plantation interests will agree with his conclusions.

# CURRENT NEWS OF THE MONTH

## WIDER USE OF NATURAL RUBBER PERMITTED IN LATEST REVISION OF RUBBER ORDER R-1

THE official demise of the War Production Board and the birth of the new Civilian Production Administration were closely tied in with activities affecting the rubber manufacturing field. One of the final acts of WPB was the issuance of a revised rubber order, while one of the first acts of the CPA was the release of a revised appendix to the rubber order, both orders relaxing the restrictions somewhat on the consumption of natural rubber in various finished products. A later amendment to Appendix II of the rubber order issued by CPA permits the use of Butyl rubber in inner tubes for all passenger car and small truck and bus sizes after the first of the year. Increases in the ceilings of various rubber products to allow for increased manufacturing costs were also announced in the past few weeks.

The revision of the Rubber Order, which is now officially known as Rubber Order R-1, as Amended November 2, 1945, authorizes the use of natural rubber and natural latex in the manufacture of approximately 75 additional products and approves increases in the percentages of natural rubber permitted in the manufacture of some 50 other items. Liberalization of natural rubber consumption made possible by the revised order, which includes Appendix I, is aimed at speeding reconversion in various lines of rubber manufacture. It is estimated that the additional amount of natural rubber to be consumed as a result of the revised order will be considerably less than the quantities that were allowed for the manufacture of military items that are either out of production or are being made in limited amounts only.

### *Use of Natural Rubber*

Among items for which natural rubber is now permitted are water bottles and combination syringes, ice bags, fountain syringe bags, invalid cushions, and fountain pen sacs. Feeding nipples and caps and covers for feeding bottles may now be made with certain amounts of natural rubber and as a result manufacturers will be able to make satisfactory nipples for large mouth nursery bottles.

Natural rubber may be used in varying amounts for a wide range of items that are essential in the rehabilitation of wounded and injured veterans. These items include crutch pads, crutch tips, dilators, orthopedic sponge pads, prosthetic devices, rubber bands and cushions for use with artificial limbs, truss pads, vaccine cups, oxygen tent canopies and face pieces for oxygen tents.

Bladders for inflated sport equipment may now be manufactured with 38 per cent natural rubber, of which 60 per cent must be guayule. This provision applies to basketballs, footballs, cageballs, punching bags, pushballs, soccer, volley and water polo balls.

The list of industrial products for which increases in natural rubber consumption have been authorized includes certain insulation compounds, vibration dampers and engine mounts, certain hard rubber products, and a number of items where rubber is needed to line equipment used in handling acids.

Other important items for which natural rubber is permitted or greater amounts have been authorized include belt splicing and repair material; cigar machine aprons; conveyor belt scrapers; screen diaphragms for paper-making equipment; street sweeper belts; escalator handrails; steam, pile drive, sand blast and divers' hose; rod or piston packing; steam valves; rubber dams for dental work; dental polishing tips and denture rubber.

In some cases where only synthetic rubber had been allowed for certain sponge and latex foam rubber products, specified amounts of natural rubber are now authorized. Articles in this category include mattresses, automobile seats, upholstery and railroad car seat cushions.

Pointing out that the increased distribution of natural rubber results from cutbacks in military orders, WPB said that thus far no authoritative information has been received concerning actual availability of substantial quantities of natural rubber in the recently-liberated areas in the Far East.

When advices of actual shipments have been received and when the Rubber Committee of the Combined Raw Materials Board has allocated specific tonnage to the United States, WPB said, it will then be possible to carry out the planned reconversion to natural rubber in many products that gave reasonable service in war time, but which need more natural rubber content in order to equal pre-war quality.

The present revision of Rubber Order R-1, which was last amended September 27, 1945, stipulates that imports of finished or semi-finished products containing natural rubber will be permitted, but the importer must furnish a certificate to the Collector of Customs indicating that the importation is in accordance with the import provisions of Rubber Order R-1.

Another new provision of the order permits chlorinated natural rubber to be used for binding natural rubber to metal in products listed in Table B of Appendix I. This type of rubber may be used only in certain end products and in specific amounts as authorized in Table B.

### *Appendix II Revised*

One of the first actions of the newly-organized Rubber Division, Operations Bureau, Civilian Production Administration, was the issuance of a revision of Appendix II to Rubber Order R-1, previously issued in amended form on May 30, 1945. Since the May 30, 1945, amended form appeared, eight amendments to the appendix were issued, all of which are now incorporated in the newly revised appendix, officially known as Appendix II to Rubber Order R-1, as Amended November 15, 1945.

Under the terms of revised Appendix II, greater amounts of natural rubber are permitted in the manufacture of 60 types of rubber footwear for men, women and children, the articles affected ranging from women's toe rubbers and dress arctics to firemen's boots, and including men's dress rubbers and arctics as well as a wide variety of rubber-soled tennis shoes with canvas uppers.

The revision also permits passenger car tires of 6.50 cross section and larger to be made with either high tenacity rayon or cotton tire cord. The rubber specification for all passenger car tires still remains S-3, this specification calling for 100% GR-S with 1.25% of natural rubber, figured on the weight of the total rubber hydrocarbon content.

An increased allowance of natural rubber for small airplane tires and the addition of approximately 20 new tire sizes to the list of those authorized for manufacture are also covered in the revised appendix. The new tire sizes are chiefly special-purpose tires, such as earth mover, rock service and logger and traction. A number of the sizes now permitted were prohibited during the war or were permitted only in minimum quantity on an appeal basis in order to obtain quantity production of certain special-purpose tires.

The synthetic construction for small airplane tires has been changed to permit 30% natural rubber, these tires formerly being made with 10 to 20% natural rubber

only. This change involves less than one ton of natural rubber per month and is expected to improve quality while lessening manufacturing problems.

Of special interest to tire repair shops and filling stations is the fact that cold-cure natural rubber cements for use in repairing and reconditioning inner tubes may now be sold in container sizes up to and including one quart. Previously this repair material could be obtained only in quarter-pint containers.

Just as this issue was going to press, the CPA issued Amendment 1 to the new Appendix II, authorizing the use of Butyl rubber in the production of inner tubes for tires for all passenger cars and small truck and tractor-implement tires after January 1. The use of Butyl in tube manufacture will continue to be restricted to inner tubes for military vehicles, certain large size truck, bus and tractor-implement tires and passenger tires of 6.50 cross section and larger, until January 1.

### *Wilson Issues Report*

The position of Director of Rubber Programs, which has been filled since last July by Robert S. Wilson, vice-president of the Goodyear Tire & Rubber Co., was discontinued on November 3 when the Civilian Production Administration officially took over the functions of the War Production Board. Mr. Wilson's one and only report as Director of Rubber Programs was issued on November 8.

In his report, Mr. Wilson stated that the task of integrating America's war-borne synthetic rubber industry with the new supply of natural rubber that will become available from the Far East is one of the momentous problems confronting the nation. He pointed out that in two years the United States created a synthetic rubber industry capable of producing 1,200,000 tons of synthetic rubber a year and that the usage of synthetic rubber has jumped from only 1% in the rubber products made in 1941 to 85% of the products being made this year.

"Tires, tubes and thousands of other rubber products must be produced to supply a nation that has been starved for rubber goods," Mr. Wilson said. "There is a tremendous pent-up demand for products made of rubber for civilian transportation, industrial use and household consumption. These demands will keep even the greatly expanded facilities of the rubber manufacturing industry busy for many months to come."

Mr. Wilson pointed out that the Civilian Production Administration, as the supply agency for the production of tires, must determine when production of the various categories of passenger and truck and bus tires is sufficient to eliminate rationing safely. With respect to the prospect for the lifting of tire rationing, he said: "Current production is climbing, but has not yet reached the levels previously anticipated. Until production becomes greater, a definite date for ending of rationing cannot be established."

In his report, Mr. Wilson presented the latest estimates of anticipated tire production for the year 1946. Total passenger and motorcycle tire production for 1946 is expected to reach 66,060,000 tires, an increase of 60,000 over the estimates made last August. Expectation of a substantial decrease in truck and bus tire production is reflected in a new estimate of 13,770,000 tires of this type for 1946 as compared with the August estimate of 15,381,000. The revised tire production figures show expected increases in the volume of tractor and implement, industrial and bicycle tires.

In reconverting from the use of synthetic rubber to natural rubber, Mr. Wilson said, a policy has been established that will govern the distribution of natural rubber as it becomes available. The policy is based on the principle of permitting the use of natural rubber first in those products where it is required for quality reasons. As an example, greater improvement in tire performance could be obtained by using relatively more natural rubber in truck tires than in passenger tires.

Due to the importance of the use of natural rubber for quality reasons in the production of large truck tires and airplane tires during the war, Mr. Wilson said, the tire industry on a wartime basis was consuming approximately 90 per cent of all natural rubber permitted.

"Historically, the consumption of natural rubber for production of tires has been 70-72 per cent of the total amounts consumed," he added. "Using the historical pattern of natural rubber consumption, which is surprisingly stable, the Rubber Bureau has calculated the percentage of natural rubber that properly applies to each segment of the rubber industry, such as tires and tubes, mechanical goods, wire and cable, footwear, soles and heels, drug sundries, etc. Each segment of the rubber industry will share in the additional supply of natural rubber in the proportion its particular segment bears to the total."

### *Technical Committees Will Help*

In connection with determining where additional natural rubber is most needed for quality reasons, the CPA's Rubber Division has the advice of approximately 17 technical consulting committees, representing the various industry segments, Mr. Wilson said. "The importance of these technical committees cannot be over-emphasized," he declared, "and it is absolutely essential that they be maintained and permitted to perform the same functions that they have over the past three years."

The most serious component shortage that threatens orderly reconversion in the field of general rubber products, according to the report, is in cotton broad woven fabrics, controlled by Order M-317-a. Production of rubber mechanical goods, footwear, coated materials and other items is being curtailed and, in some instances, threatened by the shortage of cotton textiles. The present controls established in Order M-317-a give preference to customers producing bags, to satisfy certain export requirements, and to manufacturers of low-priced clothing. The rubber industry has recommended that the controls established in this order be revoked, permitting equal treatment for all consumers of these cotton fabrics.

Another recommendation made by Mr. Wilson was that distribution controls over rosin be maintained until such time as rosin production has been increased to somewhat near the pre-war levels. He asked that the distribution controls be maintained to protect the 10 to 12 per cent rosin requirements of the rubber manufacturing, synthetic rubber and reclaimed rubber industries.

In a summary of the impact of the war on the rubber industry, Mr. Wilson stated that although it was necessary to limit the use of almost all rubber products on the homefront and to insure that such products as were manufactured went into the most essential uses, "the civilian transportation of this country did not break down."

Concerning the war-time record of the industry, Mr. Wilson said: "The co-operation of labor—the long hours of work, the no-strike pledge and in late 1944, the seven-day week in the tire and tube industry, were factors that made all-time high production possible. Success or failure to supply the maximum number of necessary rubber products to win the war quickly was dependent basically on the achievements of labor and industry."

### *Summary of Situation*

Mr. Wilson concluded his report with a summary review of the rubber situation during the war period. The review follows:

(1) Ninety per cent of our natural rubber supply was cut off in February, 1942.

(2) We had on hand or afloat at that time approximately 650,000 tons of natural rubber.

(3) This stockpile, conserved by stringent measures, gave us two years in which to develop a substitute for natural rubber.

(4) In those two years an entirely new source of supply of rubber was created —the American synthetic rubber industry—capable of producing 1,200,000 tons of synthetic rubber annually.

(5) In 1941, America's rubber products were made of 99 per cent natural rubber and 1 per cent synthetic rubber; in 1945, America's rubber products were made of 15 per cent natural rubber and 85 per cent synthetic.

(6) In the third year after the loss of Singapore, our total rubber consumption (natural and synthetic) rose to a peak higher than any previous year in our history.

(7) While the synthetic rubber polymer is not in all respects the equal of natural rubber as yet, it did the job and did it well.

(8) Broadly speaking, no vehicle, military or essential civilian, stood still for lack of tires and no military operation was delayed because rubber equipment was lacking.

### *New Rubber Division Set-Up*

As indicated above, the functions of WPB were taken over by the newly-created Civilian Production Administration on November 3. Although the retiring Director of Rubber Programs will not play a role in the CPA, he will serve as an advisor to W. L. Batt, chairman of the Inter-Agency Policy Committee on Rubber of the Office of War Mobilization and Reconversion. George M. Tisdale, vice-president of the U. S. Rubber Co., who has been serving as Assistant Director of Rubber Programs and as chairman of the Combined Rubber Committee of WPB's Combined Raw Materials Board, remains as chairman of the Combined Rubber Committee and will also serve as an advisor to Mr. Batt.

The former Rubber Bureau of the War Production Board has been reorganized as the Rubber Division of the Operations Bureau of the Civilian Production Administration. W. James Sears is Director of the Rubber Division with E. Dorrance Kelly as Deputy Director. Other key personnel of the Division include the following:

George L. Allison, assistant director in charge of the Technical Operations Branch; Carl Gibson, assistant director in charge of the Production Branch; Herbert M. James, chief, Rubber Supply and Statistics Branch; Gerald E. Perry, chief, Appeals Section; Maurice Judd, chief, Compliance Section; and John Caswell, special representative.

Serving under Mr. Allison as section chiefs are the following: Irvin J. Sjothun (Tire and Tube and Rubber Compounding and Design), Aden R. Miller (Rubber Order and Compounding Materials), R. C. Dabney (Rubber Products); under Mr. James, Isidore Abrams (Rubber Supply), Carl Buehl (Rubber Control) and Roy Faylor (Products); under Mr. Gibson, Albert E. Decker (Distribution), Tom B. Roberts (Tires and Tubes) and Marshall C. Kinney (Rubber Products).

The various Industry Advisory Committees concerned with rubber, organized under the War Production Board, will continue to cooperate with the newly organized CPA Rubber Division. Since control over the distribution and consumption of rubber is expected to continue until such time as natural rubber supplies are in adequate amount, it has already been predicted that rubber control will eventually pass to the Office of War Mobilization and Reconversion or to some other top government agency. The reason for this prediction at this early date is due to the fact that CPA is expected to liquidate its activities at the earliest possible moment.

## CEILING INCREASES ALLOWED ON CERTAIN MECHANICAL RUBBER GOODS

Manufacturers with "frozen" ceiling prices for molded, extruded, lathe-cut, and chemically-blown sponge rubber products have been allowed ceiling increases ranging up to 15% under the terms of Amendment No. 20 to M.P.R. 149 (Mechanical Rubber Goods). The amendment, issued on October 23 and effective October 29, was taken to compensate manufacturers with January 5, 1942, freeze ceilings for extra costs of production since that date, and to assure that price ceilings do not constitute an impediment to continued production of these items during the reconversion period.

Heretofore, manufacturers have had "freeze" ceilings where they had regularly quoted prices in effect on January 5, 1942. Other manufacturers who did not have quoted prices for an item on that base date were "frozen" to their January 5, 1942, pricing methods. The result has been that, where manufacturers with "freeze" ceilings refuse to produce an item for sale at these ceilings, purchasers would have to turn to other manufacturers allowed to use their base date pricing methods. In most cases this would result in higher prices.

The new action permits manufacturers with "freeze" ceilings to reestablish their ceilings by using their base period pricing methods, just as the other manufacturers without "freeze" ceilings already have been permitted to do. A limitation is provided, however, that the resulting new ceilings cannot be more than 15 per cent above the old "freeze" levels.

Other actions of direct interest to the rubber manufacturing industry issued in recent weeks included the following:

### RUBBER FOOTWEAR

Simple methods by which manufacturers, wholesalers and retailers may determine their ceiling prices for canvas-topped, rubber-soled shoes, such as tennis and basketball shoes, and for casual rubber footwear, such as beach shoes, that are now coming back on the market in prewar styles and qualities, have been provided in Amendment No. 12 to M.P.R. 132 (Rubber Footwear) and Amendment No. 3 to R.M.P.R. 229 (Retail and Wholesale Prices for Rubber Footwear), both amendments having been issued on October 12.

The ceilings, effective October 17, 1945, may be somewhat higher than the pre-war prices for these shoes because of the use of synthetic rubber. OPA pointed out, however, that the ceilings will be substantially lower than the prices for the lower quality footwear sold as substitutes for these shoes during the war period, when the regular lines were not produced. OPA is continuing in effect the dollar-and-cent ceilings that have applied to a limited line of canvas shoes produced during the war. A list is also added for casual shoes.

For new lines of canvas or casual shoes to sell below the ceilings in these two lists, manufacturers have merely to file with OPA a ceiling price for each type of shoe. This ceiling may be used by the manufacturer as soon as it is filed unless he is notified to the contrary.

On three special types of canvas shoes, differentials are provided that may be added by manufacturers to the ceilings already established for the limited range of shoes produced during the war. These differentials are 50 cents a pair for loose lining shoes, 10 cents a pair for colored soles, and 10 to 25 cents a pair for arch supports or heel cushions. For all other types of canvas and casual shoes, manufacturers have to apply to OPA for a ceiling.

Wholesalers' ceilings are the manufacturers' list prices, less base period discounts. Manufacturers are required to notify wholesalers of these list prices. Retail ceilings already are in dollar-and-cent terms for the limited wartime list of canvas shoes. On all other new canvas shoes, a margin of 38 per cent is allowed. On all casual shoes retailers are permitted a margin of 40 per cent.

Amendment 13 to M.P.R. 132, the rubber footwear regulation, was issued on October 16. This amendment deleted several types of footwear from the various classifications, and added several types of "Severe Occupational Boots and Work Shoes." Ceiling prices for the latter types of footwear were provided.

Problems in connection with the disposal of surplus rubber footwear were discussed at a recent meeting in Washington of the Rubber Footwear Industry Advisory Committee. Members were of the opinion that most items of rubber footwear already declared surplus would not affect the industry and could be absorbed readily. It was felt, however, that future declarations of items in large supply might have a serious impact if thrown suddenly on the market.

### BICYCLE TIRES

Three changes have been made in manufacturers' and wholesalers' price ceilings for bicycle tires and tubes. Retail ceilings are not altered by these changes, contained in Amendment No. 10 to M.P.R. 435 (New Bicycle Tires and Tubes), issued on November 14 and effective on November 19. The changes are:

1. Manufacturers' ceilings for the most popular size standard grade synthetic bicycle tube, 26 x 2.125, which represents approximately 80 per cent of bicycle tubes produced, are increased seven cents per pair. Other size tubes are increased proportionately. Distributors absorb the increases. On the main size tube, increased seven cents a pair at the manufacturing level, wholesalers' ceilings are raised four cents a pair, requiring absorption of three cents a pair by wholesalers. As retail ceilings are unchanged, retailers must absorb the other four cents. OPA said a study showed wholesalers and retailers could absorb these increases and still maintain a margin above

their expense rate on sales. The increases are required by law to cover higher costs.

2. Increases of approximately 20 per cent are granted in manufacturers' ceiling prices for various sizes of synthetic bicycle tire assemblies when sold to bicycle manufacturers. An assembly consists of two tires, two tubes and two rim strips. These increases are similar to one granted July 5, 1945, on the principal size of these assemblies, which represents approximately 80 per cent of all assemblies sold. That increase is now extended to two additional sizes of standard grade assemblies and to different sizes of four other grades, DeLuxe, Motor Bike, Lightweight and Premium. Manufacturers expect to resume production of these sizes and grades in the near future. Retail ceilings for bicycles are not changed by this action. The increases are to cover higher costs and are mandatory under the Price Control Act.

3. On manufacturers' sales of bicycle tires and tubes to brand owners, ceilings applicable on sales to jobbers will apply intsead of three alternative methods previously in effect. The stipulation is made, however, that no ceilings may exceed the maufacturers' ceiling price to his lowest class jobber on sales of his own brand. This action permits an increase in certain brand owner purchase prices where such prices have been below the so-called low jobber deal.

### COATED FABRICS

Reconversion provisions already in effect allowing industry-wide ceiling price increases for specified consumer durable goods have been extended to cover a limited number of coated fabrics, under the terms of Amendment No. 10 to M.P.R. 478 (Coated and Combined Fabrics).

The extension, effective November 10, applies to coated fabrics whose 1944 production was one-half or less of their last representative period of peace-time production. The reduced production must have resulted from Government restrictions or from use of the manufacturing facilities for other war goods. The third condition is that, because of a change in Government restrictions or in the needs of the war program, manufacturers generally are able to begin production again or to increase substantially the present production.

OPA said that most coated and combined fabrics have been produced in volumes equal to or greater than pre-war volumes. Such products are not covered by this extension. Those covered represent a small number of products that have been in large part or wholly out of production since 1941, such as oilcloth, bookcloth, and processed window shade cloth.

Under the reconversion provisions, OPA may, by order, either at the request of an industry or by its own motion, establish new ceiling prices that will represent normal costs, adjusted for subsequent changes in prices of materials and in factory wage rates, plus the industry's average peacetime profit margin.

The provisions require reasonable absorption by the distributive trades, so that retail prices for reconversion goods will be as close as possible to 1942 levels.

Two additional minor changes in the coated fabrics regulation were made in Amendment Nos. 8 and 9, both issued on October 23. Amendment No. 8 referred to the japanning of pyroxylin or otherwise base coated fabrics in the manufacture of artificial leather, while Amendment No. 9 affected the base period used for determining the base price of certain coated fabrics.

### TIRE FABRICS

Dollar-and-cent ceiling prices for tire and tire cord fabrics have been substituted at the manufacturing level for the March, 1942, freeze prices of the General Maximum Price Regulation. The new prices, contained in Amendment 12 to Supplementary Regulation 14E (Cotton Tire Cord, Tire Cord Fabric, and Cord Breakers), represent an average increase to producers of 9.1% above previous prices. The increase was required by the Bankhead Amendment to the Stabilization Extension Act, which makes it necessary to raise prices for tire cord and tire cord fabrics, a major textile item, to cover higher wages ordered by the War Labor Board and other increases in costs.

The adjustable pricing permission granted for cotton tire cord and fabric on February 5, 1945, was revoked at the same time the new prices were issued. OPA said that a survey made in February-March, 1945, showed that no increase was required at that time. The new pricing order does not allow any additional collections on contracts made before June 21, 1945. It allows producers to collect the difference, if they reserved it, between the June 1, 1945, ceiling and the new prices but not in excess of four per cent over the June 1 ceiling on deliveries against contracts made between June 21 and August 6, 1945, inclusive, and five per cent on contracts made since that date.

Since tire cord is a highly standardized product, made to strict specifications and sold only to industrial users, chiefly manufacturers of rubber tires, it has normally sold for fairly uniform prices. Consequently, OPA has decided that uniform dollar-and-cent prices will be both fair and practical, and this method has been approved by all five independent producers. The old GMPR prices, on the other hand, reflected short-term variations in price and differentials among producers that did not coincide with actual differences in producers' costs.

The new prices, effective October 12, 1945, preserve the customary differentials above and below the base price for a standard construction. Although the differential between standard and extra staple quality is somewhat higher than that in effect in March, 1942, it is closer to the actual average spread.

### TIRE SPLITTING

Under the terms of Supplementary Service Regulation No. 66 to R.M.P.R. 165 (Services), ceilings have been raised approximately 5.9% on the prices that can be charged for splitting tires. The increase, effective November 13, was allowed following a study of costs for this service, generally performed by "splitters" engaged by reclaimers. The new ceiling price is $15.88 per ton of tires split, which compares with a ceiling of $15.00 generally prevailing under the previous March, 1942, freeze. To encourage the continuance of this service, OPA allowed splitters to adjust prices to the new ceilings on orders performed after September 5, 1945. That adjustable pricing authority, covered by Order 46 of R.M.P.R. 165, is now withdrawn.

### MISCELLANEOUS ORDERS

A new one-pricing method for establishing maximum prices for rubber adhesives is contained in Amendment No. 24 to M.P.R. 220 (Certain Rubber Commodities), issued October 25 and effective October 30. Prices are determined by computation of direct labor and materials costs, waste and gross margin.

Shoe repair shops may charge 15 to 25 cents a pair over their regular ceiling prices for the soling of shoes when they use neolite instead of leather, according to Amendment No. 4 to S.S.R. 47 to R.M.P.R. 165 (Services). The increase was necessary because of higher price ceilings granted for neolite soles at manufacturing and wholesale levels.

## FOUR POWER RUBBER CONFERENCE BEING HELD IN LONDON

As this issue goes to press, the Rubber Study Group, which now includes delegates from the United States, Great Britain, the Netherlands and France, the latter having been invited at the last minute, is meeting in London. The meeting was officially opened on November 20 and was called to consider all angles of the current rubber situation.

The U. S. representative at the conference is Donald D. Kennedy, chief of the International Resources Division of the State Department. His advisors include John L. Collyer (Goodrich), P. W. Litchfield (Goodyear), H. S. Firestone, Jr. (Firestone), H. Stuart Hotchkiss (Cambridge Rubber), A. L. Viles (R.M.A.), George Tisdale (U. S. Rubber), Alan Grant (Rubber Development Corp.) and George White, Jr. (Rubber Reserve). E. G. Holt, chief of the Commercial Research Section of the Rubber Development Corp., is also attending the conference as an advisor to the American delegate.

A cloak of secrecy heavier than that

prevailing at most international conferences is surrounding the London Parley. The various delegations have agreed that nothing would be divulged concerning the negotiations until a communique is issued on their conclusion. Mr. Kennedy emphasized the fact that the nature of the talks would be along "exploratory" and "study" lines.

It is, however, well known that one of the most important phases of policy due for discussion at the conference concerns prices for natural rubber, particularly in relation to the production of synthetic rubber in the United States. It is understood that the American delegation is urging the necessity of maintaining a definite amount of synthetic rubber production irrespective of any price regulation agreed upon, solely as a national security measure. The Americans are also prepared to recommend the closing of high cost synthetic rubber plants in this country if the British and Dutch agree to the elimination of less efficient native rubber estates.

On the other hand, it is recognized that the British and Dutch representatives will urge higher prices for natural rubber based on the claimed necessity for offering higher inducements to producers, especially native producers, affected by rising costs of living and by political unrest.

The major problem faced by the Rubber Study Group is one concerning supply and demand. It is realized by all sides that whereas the consumption of rubber may reach 1,500,000 tons a year within a reasonably short period, the supply of rubber of all types may easily rise to 3,000,000 tons per year within 12 to 24 months. This supply and demand factor is the crux of the entire rubber problem.

### *Reports from Malaya*

According to the latest reports from Malaya, transport is proving to be the chief bottleneck in the early resumption of rubber production. Some 300 planters are expected to arrive in Singapore shortly to begin rubber production operations but unless suitable equipment for rehabilitation and industry purposes is furnished, these production experts are expected to be considerably handicapped. One authority said it would take more than six months to import trucks from Britain but American trucks could be secured for immediate use if current lend-lease regulations were modified.

Labor, too, is a problem in Malaya, but experts point out that even though only some 25% of the 1,000,000 Malayan rubber plantation workers are still in the country, operations can be started in nearly all areas by teaching former maintenance and field workers the tapping technique. Many native workers are reported to be drifting back into the rubber-producing areas while those transported to various countries by the Japanese are awaiting means of returning to Malaya.

It has now been definitely determined that the majority of plantations in Malaya are in good condition for operation although some machinery and equipment has been destroyed and some looting has occurred between the time of the departure of the Japanese and the arrival of British survey parties. According to one report, of the 3,500,000 acres of planted rubber in Malaya, less than 5% was destroyed by the Japanese, most of this being cleared away to make way for food crops or to provide a field of fire against attack. Although some processing equipment was dismantled and carted off, it is believed that the greater part of it can be recovered.

Collections of rubber are still being found throughout the peninsula and thousands of tons are awaiting shipment, which is being somewhat retarded by lack of shipping facilities. Some 25,000 tons from captured Japanese stocks were expected to be shipped to the United States and the United Kingdom by the end of this month.

Incidentally, the MacArthur command in Tokyo ordered the Japanese Government on November 6 to report the disposition of all rubber stocks taken by the Japanese from Malaya.

### *Dutch Issue Report*

The official Dutch inquiry committee in Java reported on November 5 that Java rubber and cinchona plantations have suffered little damage but that tea and coffee plantation losses will probably amount to 30 or 40%. The resumption of rubber activities in Sumatra is, of course, dependent on the settlement of the political differences now existing between the Indonesians and the occupying authorities. The Netherlands Indies Rubber Administration, which will exercise general control over rehabilitation of the rubber industry, is already organized and is ready to function as soon as possible.

A special committee has been named by the Netherlands Government to handle the receipt and distribution of goods from the Netherlands East Indies in this country. Jacobus F. Frank is a member of this committee. According to the committee, exports from the Netherlands Indies will begin reaching the United States by the end of the current year unless political conditions interfere.

### *End of Guayule Project Foreseen*

Efforts to save some part of the official Guayule Emergency Rubber Program have apparently failed in Congress. In a debate on the Appropriations Bill, which took place on October 19, amendments designed to save the research part of the program were introduced by Rep. Poage (Texas) and Rep. Anderson (Calif.), both of which were defeated. The House recommended that the government scrap the $40,000,000 guayule program and also wants the processing plants declared as surplus and disposed of as such.

According to Rep. Poage, who has been championing the guayule program for the past few years, the agricultural department "made a miserable mess" of its report to the Appropriations Committee, in addition to which some of the major rubber companies actively discouraged the program. He added that the argument that the United States should cultivate guayule as a domestic rubber source lost ground in favor of the idea of retaining synthetic rubber production capacity and in building up a large stockpile of natural rubber.

### *Defeat of Bill Seen*

Rep. Poage also stated that he did not intend to withdraw the guayule subsidy bill, in which a price of 28c a pound for total plantings (not to exceed 400,000 acres) would be guaranteed by the government, but stated that its chances of passage in the Senate were very slight. The bill has been tied up in the Senate Agriculture Committee for the past several months and as yet no hearing on it has been scheduled.

Rep. A. J. Johnson (Ill.) issued a statement on November 15 in which he urged that the government turn over its experimental guayule rubber shrubs to private industry rather than abandon the 30,000 acre wartime development in California. He said that such abandonment and destruction of the current crop will occur soon unless Congress acts in a reasonably short time.

## PRODUCTION OF AUTO TIRES REACHED 7,045,916 IN THIRD QUARTER

Production of passenger car tires totaled 7,045,916 in the third quarter of the year, according to figures made public on November 7 by W. James Sears, director of the CPA Rubber Division. In the first nine months, passenger car tire production amounted to 17,146,155 tires, an increase of 37% over the total of 12,531,318 units produced in the same period in 1944.

With facilities for passenger car tire manufacture being increased, recently revised estimates indicate the production of 11,000,000 passenger car tires in the fourth quarter, Mr. Sears added. Passenger car and motorcycle tire production is expected to total 66,060,000 for the year 1946. Because of the wartime demand for truck tires, he said, it was possible to produce only about 5,000,000 passenger car tires in each of the first two quarters of 1945.

In the first nine months of this year, tire manufacturers produced a total of 13,252,513 truck and bus tires as compared with 10,721,098 made in the same period in 1944. Due to direct military demands, it was impossible to make available for civilian replacement use more than approximately one-fourth of the total number of truck and bus tires manufactured thus far this year.

Since production of tires for military needs is now negligible, substantially all of the current truck and bus tire output will be available for civilian truck and bus use, either as replacements or for original equipment.

Inventories are now well below normal in almost every tire group, Mr. Sears said. He pointed out, however, that since tire wear is about one-fourth less during the winter months than in the hot summer weather, it is expected that inventories of both dealers and manufacturers will be improved in the months just ahead.

### *November Tire Quotas*

Passenger tire and large size truck tire quotas for November, announced by OPA on October 25, were the same as for October—2,500,000 for passenger cars and 250,000 for trucks. The November quota of small truck tires, size 7.50 and under, however, was reduced from 500,000 in October to 350,000. This reduction was forced by a combination of heavy demand for small truck tires to be used as original equipment on new trucks and a smaller increase in production than anticipated.

The passenger tire shortage continues to remain most acute, according to OPA, with demand far exceeding available supplies. The shortage is forcing most local boards to limit certificates to applicants who have no other means of getting to their jobs or of performing them. Total production of passenger tires in September amounted to only 2,632,171 units, and October was expected to fall short of planned production.

### *Prices for Regrooved Tires*

Prices for regrooved and remolded tires have been re-established in Amendment No. 4 to R.M.P.R. 528 (Tires and Tubes, Recapping and Repairing, and Certain Repair Materials). The amendment, effective October 30, also clarifies the definition of non-usable tires.

The previous M.P.R. 528 of April 20, 1944, had defined used tires as those with continuous tread design, smooth tires, and basic tire carcasses. The smooth tire category had included regrooved and remolded tires, thereby granting the latter a higher maximum price than that for basic tire carcasses. The revision of 528 in March, 1945, omitted mention of regrooved or remolded tires. The current action prices regrooved and remolded tires in the same category with smooth tires, or basic tire carcasses, rather than with used tires. This action, therefore, corrects the previous overpricing.

In connection with the definition of used tires, Amendment 4 states that, of the five specified wear conditions by which a tire is rendered non-usable, the presence of any one condition is sufficient to render a tire non-usable. This clarifies the doubt raised by the wording of the regulation as to whether or not all five conditions were required to exist before a tire could be defined as non-usable.

### *Miscellaneous Tire Regulations*

Under the terms of Amendment No. 111 to Ration Order 1A (Tires, Tubes, Recapping and Camelback), issued on October 26 and effective October 27, the permitted number of tire manufacturers' wholesale distribution outlets was increased from 75 to 100, thus expediting tire distribution at wholesale levels. The amendment also permits the free transfer of tires in American Samoa.

Existing ceiling prices for sound used airplane tires will apply to airplane tires that have been recapped with airplane types of tread and declared surplus by the armed forces, according to Order 83 under Supplementary Order 94 (Maximum Prices for Sales of Certain Newly Recapped Tires). The ceilings, effective November 14, are in dollar-and-cent terms at retail for different sizes and plies, while for government agencies or wholesalers the ceilings will be 25% under the retail levels.

## Buffalo Hears Lockwood

Warren S. Lockwood, executive vice-president of the Rubber Manufacturers Association, was the featured speaker at a meeting of the Buffalo Rubber Group, held at the Hotel Westbrook, in Buffalo, N. Y., on October 18. Mr. Lockwood discussed his trip around the world last year when he visited MacArthur and Mountbatten in connection with plans to expedite the flow of rubber from the Far East after recapture from the Japanese. He also told of his stay in London as Rubber Attache at the Embassy during the bomb blitz. At the conclusion of his talk, Mr. Lockwood discussed some of the problems which will result from the world surplus of rubber once a free flow of natural rubber from the Far East has been re-established, and in this connection he stressed the necessity of the early crystallizing of a national rubber policy.

## Takes Over Nevada Plant

Much needed supplies of chlorine, caustic soda, anhydrous hydrochloric acid, and hydrogen for post-war developments are assured industry by the Stauffer Chemical Co. which has announced the expansion of operation in the caustic soda and chlorine section of the vast Las Vegas, Nevada, magnesium plant under lease from the Reconstruction Finance Corp. One of the largest and most modern chlorine-caustic soda units in the country, the plant is a part of Basic Magnesium, Inc., which was closed down following cessation of hostilities in Europe. Using only half of the huge productive capacity of the Las Vegas facilities, Stauffer is offering other manufacturers an opportunity to establish branch factories at the location in a cooperative arrangement with the Reconstruction Finance Corp.

## History of Naftolen

According to the Wilmington Chemical Corporation, which maintains headquarters in New York City and factories and laboratories in Wilmington, Delaware, the Naftolen used in Germany, the widespread use of which is indicated in the summary reports on the manufacture of rubber products in Germany recently issued by the WPB Rubber Bureau, some of which are being published in full in this journal, is made by the same processes as the Naftolen produced in the United States. The originator of the unsaturated hydrocarbon extenders, Fritz Rostler and Vilma Mehner Wilson, who developed Naftolen at the University of Vienna and introduced it to the European rubber industry, came to this country in 1938. They designed and put into operation the first factories in Europe, and were instrumental in starting the production of Naftolen in this country. Dr. Rostler, who was until recently chief chemist of the Wilmington Chemical Corporation, is now Research Professor of Chemistry at the University of Delaware, and continues his connection with this company as a consultant. Dr. Wilson is at the New York office of the Wilmington Chemical Corporation. Our readers might be interested in knowing that the Germans accorded recognition to Dr. Rostler and Dr. Wilson by issuing the patents for the production and use of Naftolen to them as inventors, even though they were in this country at the time, and their material benefits from the patents were confiscated.

## Plan New Wagum Plant

Plans for constructing a factory in Georgia for the manufacture of "Wagum," the synthetic rubber-like material which features oil-resistance, have been announced by the American Wagum Rubber Co. According to Armand May, of Atlanta, Georgia, one of the backers of the new company, plans call for not only the manufacture of the synthetic material but also eventually for the production of finished end products as well. Wagum is currently being produced in a pilot plant at Akron, Ohio. Tires recapped with Wagum are said to provide from 20 to 70% more wear than tires recapped with the standard synthetics. Raw materials for the production of the synthetic are reported to be amply available wtihin the state of Georgia.

## Makes Canadian Affiliation

The Watson-Stillman Co., Roselle, N. J., has made arrangements with Canadian Vickers, Ltd., Montreal, Canada, to manufacture its entire line of hydraulic equipment in Canada. The new manufacturing facilities obtained through this arrangement will greatly increase the availability of Watson-Stillman products and service to all Canadian users. The Canadian Fairbanks-Morse Co. will continue to act as sole Canadian sales agents for the company.

# STATEX-B

For

## DYNAMIC REINFORCEMENT

• A COLUMBIAN COLLOID •

COLUMBIAN CARBON CO. MANUFACTURER

BINNEY & SMITH CO. DISTRIBUTOR

# STATEX-B

## For Heavy Duty Truck Treads

In this type of service the problems of lowering heat build up and improving flex life while maintaining good wear are important both in natural rubber and GR-S. Statex-B provides the answer to these problems.

The net result is better over-all performance for treads containing Statex-B as compared to those made with channel black.

## For Carcasses, Cushions and Breakers

Statex-B has already proven itself in these inside parts of tires made with natural rubber. Such stocks made with Statex-B are stronger and yet as cool running as those made with zinc oxide and have the outstanding advantages of:

1. **Greatly improved flex life**
2. **Appreciably lower weight**
3. **Economy—5 to 10% lower volume cost**

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## MICRONEX

*For 30 years*—The Standard Reinforcing Carbon

## FURNEX

The High Resilience Carbon

**COLUMBIAN CARBON CO.**
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## ALIEN PROPERTY CUSTODIAN RETAINS BUNA RUBBER RIGHTS

In a decision handed down in New York City by Federal Judge Charles E. Wyzanski, Jr., on November 8, the Alien Property Custodian was ordered to return to the Standard Oil Co. of New Jersey all patents the company bought prior to 1939 for $35,000,000 from I. G. Farbenindustrie, A.G., which were seized by the government and retained by it since March, 1942, under provisions of the Trading with the Enemy Act. However, it was decreed that the government could retain title to those licenses and patents that Standard Oil obtained from the German trust after the start in Europe of World War II.

Judge Wyzanski held that contracts made at The Hague between Standard and I. G. officials were in effect not bona fide. Under these contracts Standard acquired patents for the manufacture of buna rubber, the acetylene arc and paraffin oxidation processes. The patents that the Government has been ordered to return to Standard cover the manufacture of high octane gasoline. The trial challenging the right of the Government to seize and retain the patents began last May and ended the latter part of June.

In his opinion Judge Wyzanski said: "Stated summarily, this decision gives to Standard Oil Company or others in the Jersey group everything which they had prior to Germany's attack upon Poland in 1939, that is, the legal title to and equitable interest in licensing, royalty and other rights in patents useful in the hydrocarbon field. These patents and rights, however, remain subject to the terms of the consent decree entered in 1942 by the United States District Court for the District of New Jersey.

"The decision denies plaintiffs' claims to, and allows the custodian to keep legal title to and, subject to the consent decree, a limited equitable interest in patents useful in the hydrocarbon field, the full equitable interest in the patents for all types of the buna, acetylene arc and paraffin oxidation processes.

"These properties which the custodian is allowed to retain were, in general, the properties which the Jersey group acquired at or after the September, 1939, conference held at The Hague."

The court found that the true nature of the agreement at The Hague was revealed by the fact that although it involved important transfers from I. G. to the Jersey group, the latter never gave in return any stock or any cash, aside from a $4,000 loan that is fully secured by a legal lien.

### Philadelphia Meets January 4

The next meeting of the Philadelphia Rubber Group will be held at the Benjamin Franklin Hotel, Philadelphia, Penna., on Friday, January 4. Dinner is scheduled for 7:30 P.M. The name of the speaker and the subject of the evening's talk will be announced later.

## Coming Events

**Nov. 27.** A.S.M.E., Rubber & Plastics Division, Hotel Pennsylvania, New York, N. Y.

**Dec. 4.** Los Angeles Rubber Group, Xmas Party, Theatre Mart, Los Angeles, Calif.

**Dec. 5.** Trenton Chemical Society, Trenton, N. J.

**Dec. 14.** Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit, Mich.

**Dec. 14.** New York Rubber Group, Xmas Party, Hotel McAlpin, New York City.

**Dec. 21.** Boston Rubber Group, Xmas Party, Copley Plaza Hotel, Boston, Mass.

**Dec. 21.** Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

**Jan. 4.** Philadelphia Rubber Group, Benjamin Franklin Hotel, Philadelphia, Penna.

**Jan. 7-11.** S.A.E., Annual Meeting, Book-Cadillac Hotel, Detroit, Mich.

**Feb. 25-Mar. 2.** 20th Exposition of Chemical Industries, Grand Central Palace, New York City.

**Apr. 10-12.** Rubber Division, A.C.S., Atlantic City, N. J. (Tentative).

**Sept. 8-15.** American Chemical Society, Chicago, Ill.

### Review Research Achievements

Two years ago, when the Goodyear Tire & Rubber Co. opened its new research laboratory in Akron it issued a booklet written by David Dietz, noted science writer, entitled "The Goodyear Research Laboratory." Now, upon the occasion of the second anniversary of the opening, Goodyear has issued a second booklet, also prepared by Mr. Dietz, entitled "The Second Anniversary of the Goodyear Research Laboratory." The new booklet recounts some of the accomplishments of the laboratory in the two-year span, mention being made of bullet-sealing tanks, synthetic rubber, Pliobond, various vinyl chloride copolymers, Pliofoam, Dektred, cotton fiber, and high-frequency vulcanization. Copies of the booklet may be secured on request to the company.

### Two Retain Giffels Concern

The Rubber Division of Giffels & Vallet, Inc., engineering firm of Detroit, Mich., with headquarters in the Marquette Building, has been retained by the Sheller Manufacturing Co., of Portland, Indiana, and Gutta Percha & Rubber, Ltd., of Toronto, Canada, in modernization programs. The Sheller company plans to increase production of hard rubber steering wheels from 6,000 to 15,000 daily, which involves the streamlining of the plant layout and the incorporation of some additional equipment.

## GENERAL TIRE ACQUIRES PENNSYLVANIA RUBBER CO.

Purchase of the Pennsylvania Rubber Co., of Jeannette, Penna., from the du Puy estate, was announced by the General Tire & Rubber Co., Akron, on November 1. Howard W. Jordan, president of Pennsylvania Rubber since 1941, and his associates will continue to direct the company policies in the same capacity. Under Jordan's direction production capacity has been doubled, and the factory has been enlarged to 475,000 square feet of floor space.

Pennsylvania Rubber will continue to manufacture and merchandise the Pennsylvania line of tires, will retain its dealer organization and will follow present policies of sales, purchases, merchandising and personnel, it was announced.

Acquisition of Pennsylvania by General Tire makes the latter company an even more potent factor in the rubber industry, it was pointed out. It is the latest step in an expansion program aimed at the post-war market. Already fifth in the tire field, the addition of Pennsylvania, seventh company in tire sales, will give General Tire an annual peace sales volume which will approach the wartime sales volume. In 1944 Pennsylvania reported sales in excess of $24,000,000 and General's sales total was more than $74,000,000.

General's holdings now include the main factory at Akron, where production facilities have been greatly increased in the last five years; a new tire plant at Waco, Tex.; a mechanical rubber goods factory at Wabash, Ind.; a cotton mill, also recently expanded, at Barnesville, Ga.; control of the Aerojet Engineering Corp. at Pasadena, Calif., where the company turns out jet rockets to assist military and commercial airplanes in taking off with heavy loads; a metal products division in Akron, and a new $500,000 laboratory in Akron.

In addition to the above, General Tire also owns 25% of the stock of the Mansfield Tire & Rubber Co., Mansfield, Ohio, and has another 25% under option. According to reports in financial circles, General is expected to exercise its option for the additional 25% of the stock shortly, and is also attempting to secure an additional amount of such stock so that it will have complete control of the company. The Mansfield concern is older than General Tire and is believed to have a capacity of 7,500 tires daily. Net sales of the company in 1944 amounted to $25,076,000.

### Cofax Corp. Moves Plant

The Cofax Corporation, producers of masking tape, has announced the removal of its plant, sales department, purchasing department, and business administration offices from Long Island City, N. Y., to the new Cofax Building, 381 Sunrise Highway, Lynbrook, L. I., N. Y. The company's executive offices will remain at 50 E. 42nd St., New York 17, N. Y.

## U. S. RUBBER REPORTS ON EASTERN PLANTATION LOSSES

The United States will have to depend on synthetic rubber for the next three to five years because it will require that length of time to get natural rubber operations back to normal, according to John W. Bicknell, managing director of plantations for the U. S. Rubber Co. Mr. Bicknell issued his statement after receiving eye-witness reports from Malaya and Sumatra furnished by Wallace E. Cake, head of the company's scientific research on its plantations, who recently arrived in this country. Following release from a Jap prison camp where he had been held since 1942, Mr. Cake was able to observe some of the plantation areas before leaving for the United States. Some data was also furnished by other company employees recently released from enemy prison camps.

The reports indicate that 1,500,000 trees on Sumatra and 300,000 on Malaya out of 10,000,000 on the U. S. Rubber plantations before the war were destroyed by the Japanese. In addition, loss of equipment was heavy and the reports indicated that the company faces the replacement of the major portion of its mechanical equipment. Another factor involved in the possibility of early production is the disappearance of a large part of the labor forces in both Malaya and Sumatra, possibly as much as 50 per cent. Restoration of rubber estate labor forces will be a difficult problem, Mr. Bicknell stated, and its solution will depend greatly upon the speed with which stable conditions are established.

In discussing the company's staff in the Far East, Mr. Bicknell said, that before the war, the company had 125 European and American men on its Far Eastern staff. Twenty-one of these escaped from the Far East, but 104 were interned in Japanese prison camps and in slave labor battalions in Siam and Burma. However, 83 of the 104 internees are reported as being alive, 6 have not been heard from as yet, and reports indicate that 15 have been killed or have died in the camps. Those already heard from are in fit condition to return to work as soon as conditions allow and, according to Mr. Bicknell, their chief desire seems to be to help rebuild the institutions with which they have been associated for so many years.

To estimate financial damage and report on the advisability of rebuilding to pre-war status in view of the industry's enormous synthetic rubber program will be the purpose of a survey party of engineers and planters which the company plans to send to Sumatra and Malaya, Mr. Bicknell stated. The company's plantations operations before the war represented a total investment of $38,000,000. Of 131,000 acres, 101,641 acres were planted with 10,000,000 trees with a capacity of 75,000,000 pounds of rubber per year. More than two thirds of the rubber was preserved, concentrated and shipped to this country in the form of latex.

## Wolf Joins Standard Chemical

Ralph F. Wolf

C. J. Harwick, president, has announced the addition of Ralph F. Wolf to the staff of the Standard Chemical Co., Akron. For the past two years Mr. Wolf has been chief chemist of the Polson Rubber Company, Garrettsville, Ohio. Since March of this year he has also been acting as special consultant to the WPB Rubber Bureau on inner tube problems. From August, 1941, to September, 1943, Mr. Wolf was with the Office of Production Management and its successor, WPB, first as assistant chief of the Synthetic Rubber Section of the Rubber Branch, then as chief of the Synthetic Rubber Allocation Section, and finally as consultant on Butyl rubber to the Office of Rubber Director. He held the distinction of being the youngest "dollar-a-year" man employed by the O.P.M. Prior to going to Washington in 1941 he was the director of the Standard Oil Development Company's synthetic rubber compounding research laboratory at Elizabeth, New Jersey, and still earlier he held various technical positions with the B. F. Goodrich Company in Akron and Kitchener, Ontario. Mr. Wolf is the author of "India-Rubber Man, the Story of Charles Goodyear," which was published in 1939, and co-author with his brother Howard of "Rubber, a Story of Glory and Greed," published in 1936.

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The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., has received a citation from OPA "for the adoption and efficient operation of an organized transportation plan under which the establishment, through its transportation committee and the cooperation of its employees, has contributed much to the maintenance of essential transportation during the war period."

## R.M.A. REPORTS ON CIVILIAN PASSENGER TIRE PRODUCTION

Production of civilian passenger car tires is running approximately 35% behind requirements, according to a recent report of the Rubber Manufacturers Association, New York City, based on latest production reports. This means that output fails by 2,100,000 units to reach present monthly capacity, estimated by the industry at 6,000,000 casings in passenger car sizes. It also means that little or no progress is being made toward eating into a staggering 4-year backlog of civilian tire demand. It means, furthermore, that there are not going to be tires for everybody for a long time to come—certainly not when rationing ends, if it ends this winter.

The industry believes that it will be at least late summer or early fall before the average driver can walk into his favorite store and buy his favorite tires in any quantity he may require. One of the chief limiting factors is manpower. The tire-manufacturing industry needs at least 7,000 workers at once. The existing shortage of labor was aggravated in October, when plants in Akron and Los Angeles operated only on the basis of a 6-hour day, and the plants thus affected account for more than half of the nation's tire production. Where the 6-hour day is operative, the gap between production and capacity is most acute.

Another important phase of the manpower shortage is absenteeism. This continues high, so high, in fact, that it has become an important factor in a weekly equation that involves trimming and cutting production schedules to the point that the schedule can be made to balance with the output of available manpower.

There are several ways in which the gap between lagging production and capacity could be closed, according to the report. It could be pretty well closed if the industry could get 7,000 workers. It could certainly be narrowed by a return to the 8-hour day until sufficient labor to warrant 6-hour day operations became available. Or it could be closed, even with present manpower, if sufficient improved tire-building machinery were available.

Enough of the new high-speed machines could close the gap. But to date, only a few of them have been installed, since they are expensive and require a long time to be put into operation. However, the report concludes, even if the gap were closed today, it would be months before tires could be made available in normal supply.

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## Form Pioneer Latex Company

A. E. Powell and Victor Golden, both formerly connected with the Flintkote Co., have organized the Pioneer Latex and Chemical Co., with headquarters at 10 Avenue B, Newark 5, N. J. The new company will engage in the manufacture and sale of latex cements and compounds, and various latex specialties.

## SOUND NATIONAL POLICY IS URGED BY COLLYER

We must not fail to prepare now for our continuing military security and for a wise solution of the surplus problem which will result from an estimated potential world capacity of 3,000,000 tons of natural and synthetic rubber, according to John L. Collyer, president of the B. F. Goodrich Co., Akron, and former Special Director of National Rubber Programs, who recently made public an analysis of the world rubber situation in one of a series of releases on this subject issued by his company. The magnitude of this coming surplus problem is indicated by estimates that annual world consumption will be approximately 1,500,000 tons, he pointed out.

Mr. Collyer emphasized that because the supply of natural rubber will be at first a mere trickle, a year or more remains during which sound and constructive rubber policies can be adopted, and cited the following considerations as keys to an enlightened rubber policy for the United States and for the world: military security, greatest consumer value, and expansion of rubber uses through low and stable prices.

"Military security must rest on a legislated program, one chosen by an informed American people acting through their elected representatives in Congress," Mr. Collyer said, "and greater consumer value and expanded rubber uses will come most quickly from free individual initiative, unhampered by artificial restrictions and controls. To insure military security, we believe our government should maintain a total standby general-purpose synthetic rubber production capacity of 600,000 to 700,000 tons a year in plants kept in condition and ready to run. From this capacity we recommend a minimum production and use of 200,000 or more tons a year of general-purpose synthetic rubber, regardless of economic factors."

According to Mr. Collyer, it is estimated that for the next five years, America's rubber needs will average 825,000 tons a year, or about 25% greater than in 1940. Thus there will be left an average of 525,000 to 625,000 tons a year or a high pre-war total rubber consumption level.

In discussing the world rubber market, Mr. Collyer said, "The reality of low-cost, high-value American synthetic rubber is the pivot on which post-war rubber developments will turn. A prime objective of natural rubber producers should be to regain through their price policies such a sizable share of the world rubber market as is needed to sustain their economies and to make possible rising standards of living in the rubber-growing territories. If many nations with presently lower standards of living are to expand their use of rubber, its price must be low. To this end, the earliest possible establishment of a Far East price of around 12 cents or less a pound for natural rubber would assure efficient rubber growers a reasonable advantage in the face of competition with low-cost synthetic rubber, as well as a reasonable return on their plantation investments."

"However," he added, "there must first come a period when the plantations are resuming production. At the outset the price might well be the 18½ cent level at which rubber was sold in the Far East during the prewar period when we were building emergency stockpiles while the war clouds were gathering and before synthetic rubber had become an active threat to natural rubber prices."

Mr. Collyer stated that compared with the estimated future per capita consumption of fourteen pounds of rubber annually in the United States for the years 1946-1950, the average for the rest of the world for the same years is estimated at only eight-tenths of a pound. "If the average annual consumption of the rest of the world could be expanded to only two pounds per capita, an extra one million tons of rubber would be consumed year after year," he pointed out. He recommended that 25,000 tons of alcohol process capacity be maintained as insurance of continued development of rubber from distress farm products.

Mr. Collyer's analysis estimated potential American synthetic rubber capacity at 1,000,000 tons annually, and that of countries outside the United States, including Canada, Russia, Germany and others at 400,000 tons annually. He also estimated that the world's natural rubber productive capacity would be 1,600,000 tons annually if all sources were utilized. This estimate was based on the fact that although large labor forces have been scattered, requiring time for recruiting and training replacements, and much of the equipment needed in the preparation of natural rubber must be repaired or replaced, 90% or more of the trees in the Far East are still intact.

## RUBBER DIVISION, A.C.S., TO MEET IN ATLANTIC CITY

It has now been established that a meeting of the Division of Rubber Chemistry, A.C.S., will be held in Atlantic City the week of April 8 to 12, in conjunction with the parent society, providing government regulations concerning such meetings will be relaxed as expected. The Division will probably hold a three-day meeting, on April 10, 11 and 12, if possible, and is trying to secure the Ambassador Hotel as headquarters.

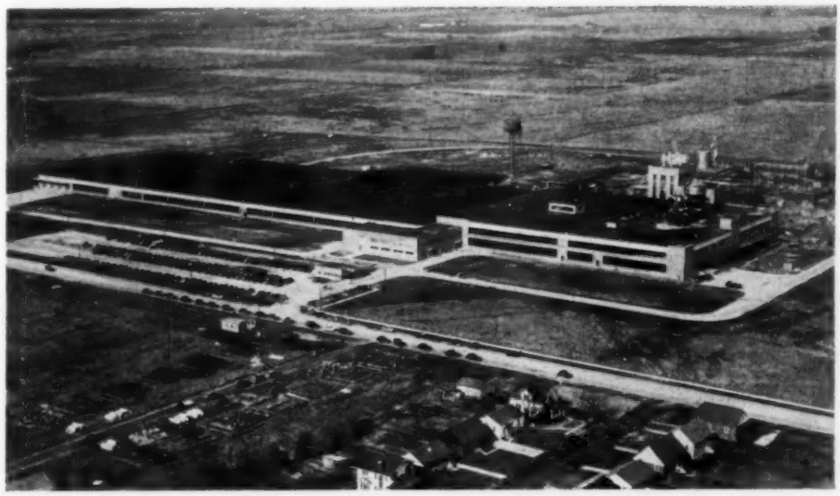
A special committee has already been named to handle details of the meeting for the Division. Harry Bimmerman (DuPont) is chairman in charge of local arrangements, assisted by the following: *Entertainment,* Sam Martin (Thiokol); *Banquet,* William H. Ayscue (DuPont); *Housing,* Larry Youse (Gilmer); *Tickets,* William B. Dunlap, Jr. (Lee Tire). The last meeting held by the Division was staged in New York on April 26, 27, and 28, 1944.

In accordance with an interpretation of the constitution of the American Chemical Society, all officers of the Rubber Division continue to hold their offices for 1946, in view of the fact that there were no meetings held in 1945 and no letter ballot for the election of new officers was held. All standing committees have also been reappointed.

### Crossley Leaves Xylos Rubber

R. H. Crossley, Manager of Butaprene Sales of the Xylos Rubber Co., Akron, Ohio, for the past several months, has left the Xylos organization. He is expected to make an announcement of a new connection within the next few weeks.

## GOODRICH'S MIAMI, OKLAHOMA PLANT NOW IN FULL PRODUCTION



*The tire plant at Miami, Oklahoma, built by the B. F. Goodrich Co. is now in full operation turning out civilian tires of several types. The plant will produce approximately 200,000 pounds of finished products daily, providing employment for about 750 men and women.*

## CHICAGO HEARS TALK ON NEW SILICON MATERIALS

An interesting talk on "Silicones—New Engineering Materials," delivered by R. W. Kolderman of the Dow Corning Corporation, Midland, Michigan, featured the regular meeting of the Chicago Rubber Group held on November 9 at the Morrison Hotel in Chicago, Ill. In addition to Mr. Kolderman's address, John P. Coe, general manager of the Naugatuck Chemical Division of the U. S. Rubber Co., a guest of the evening, was called upon to deliver a brief talk on the synthetic rubber situation. Mr. Coe urged the continued use of as much GR-S as possible as one means of keeping present polymer plants in operation to help stabilize the price of natural rubber.

In his talk, Mr. Kolderman reviewed the history of the organo-silicon compounds, their properties and their reactions compared to carbon compounds. He also discussed the development of the silicones from the laboratory stage into full scale industrial production, as well as the properties and various applications of the silicone fluids, resins and rubber. An abstract of the talk, as furnished by the author, follows:

### *Abstract of Silicon Paper*

Certain similarities between carbon and silicon and their juxtaposition in the periodic table of elements stimulated early investigation of the organo-silicon compounds. The basic differences between these two non-metals have led to the development of an entirely new class of materials and the establishment of a new chemical industry. Example of the basic difference between silicon and carbon is found in carbon dioxide, a gas, and silicon dioxide, a solid fusible only at high temperatures. The unusual heat stability, electrical resistance and water repellency of the silicones are doubtlessly due to the uniqueness of silicon dioxide.

Between 1861 and 1930, practically all research work in silicon chemistry was directed toward the formation of structures analogous to carbon compounds through the complete or partial displacement of carbon atoms by silicon atoms. In the years between 1900 and 1930, the field of organo-silicon chemistry was dominated by the brilliant research work of Dr. Alfred Stock and Dr. F. S. Kipping. In 1904 Dr. Kipping reacted various Grignard reagents with $SiCl_4$. His early employment of that method of synthesis proved to be a very convenient and versatile way of attaching hydrocarbon groups to the silicon nucleus.

However, no commercially useful silicone products were developed until early in the 1930's when Dr. Eugene Sullivan of Corning Glass Works assigned the problem of developing a heat-stable, flexible varnish for coating Fiberglas cloth to Dr. J. F. Hyde. A polymeric structure made up of basic silicon-oxygen chains or rings with hydro-carbon radicals attached to the silicon atom to give the polymer flexibility and solubility was visualized. Working on that hypothesis, Dr. Hyde synthesized the first flexible, thermosetting silicone polymer.

Further development of this first useful silicone resin resulted in DC 993, an insulating varnish for bonding and impregnating glass cloth, mica and asbestos. This semi-inorganic varnish for waterproofing inorganic materials permits electrical equipment to operate at temperatures about 200°F. above previous temperature limits and makes possible increased power output per unit weight, greater overload protection and reliable performance despite adverse conditions such as excessive moisture and high ambient temperatures.

Shortly after Dr. Hyde's successful synthesis of flexible resins, the study of inert liquid silicone polymers was assigned to the Technical Glass Fellowship, under the direction of Dr. R. R. McGregor at Mellon Institute. He and his associates succeeded in producing a whole family of fluids which became the first of the silicones to be produced on a commercial scale. In the course of that development much was learned about low polymers having both linear and cyclic structures.

The low polymeric linear and cyclic fluids, as well as the high polymeric non-volatile fluids, are characterized by exceptional heat stability, relatively slight changes in viscosity over a wide temperature range, low pour points ranging from —45° to —110° F. and good dielectric properties.

A special series of silicone lubricating oils have also been developed which are comparable in lubricity to petroleum oils containing extreme pressure addition agents. These silicone oils are serviceable for prolonged periods at 350° F. By compounding these oils with suitable thickening materials, a number of greases have been developed. Among them are: greases for the lubrication of ball bearings operating at temperatures as low as —94° F. and as high as 350° F.; a grease designed for pressure lubricated valves which does not harden at —40° F. or melt at 400° F.; a stopcock grease for the lubrication of laboratory equipment and high vacuum apparatus; and a special sealing compound and rubber lubricant to replace air as a dielectric, to exclude moisture and prevent corona cutting in aircraft ignition systems and in radar and radio junctions.

By varying the degree of polymerization, a heat stable silicone rubber known as Silastic has been developed. Unlike natural rubber, this silicone rubber remains flexible at —70° F. and serviceable at 500° F. Silastic is available in two general types: SR stocks for extruding or compression molding, and SC stocks for coating fabrics and resistor coils or for fabricating Silastic products reinforced with fabrics of metal, glass or asbestos.

SR stocks are furnished as sheeted crepes; SC stocks as heavy solvent-free dopes having the consistency of a heavy ointment. All Silastic stocks are characterized by retention of elasticity at extremely high and low temperatures, by excellent dielectric properties, and moisture resistance. Intensive research work is still being done on Silastic. Recently new formulations have been developed which have markedly better tensile strength and elongation. Shore durometer, A scale, of these new Silastic stocks ranges from 40 to 65; tensile strength from 280 to 500 p.s.i.; elongation from 150% to 260%; power factor ($10^6$ c.p.s.) from 0.10 to 0.12 with dielectric strength of about 500 volts per mil.

Largest present uses for Silastic are: insulator extruded over copper wire for conductor leads to electric furnaces, ovens, motors, and household appliances; gaskets for high temperature equipment; and as a coating for conveyor belts made of glass cloth.

Silastic, the newest of the silicone products, has gone far since it first became available in commercial quantities less than a year ago. Like the other silicones it enables engineers and designers to revise old concepts of the properties of materials and to take advantage of an increase in permissible operating temperatures of about 100° C.

### Tractor Demand Up

A speed-up of the trend toward "more horsepower and fewer horses" on American farms will mean an annual demand for nearly 250,000 new tractors for the first five post-war years, about 10% higher than the average for the last five pre-war years, according to James J. Newman, vice-president of the B. F. Goodrich Co. Combined tractor and implement original tire requirements are estimated at 2,123,000 units for 1946, 2,070,000 units for 1947, and 1,850,000 for 1948. Replacement units for these years are estimated at 1,095,000, 1,050,000, and 907,000, respectively.

### Trenton Group Holds Meeting

Approximately 45 members and guests of the Trenton Chemical Society attended the meeting held on November 6 at Kelly's Restaurant in Trenton, N. J., to hear Dr. G. B. L. Smith, of the Polytechnic Institute of Brooklyn, deliver a talk on "Non-Hydrogen, or Non-Protonic, Acid-Base Equilibrium." Dr. Smith spoke principally on selenium oxychloride as a parent solvent of a system of compounds known as the "selenium oxychloro solvo-system of compounds." The next meeting of the group is scheduled for December 5, when the speaker will be Dr. Hubert Alyea, of Princeton University, whose topic will be "Atomic Energy."

## SERIES OF MEETINGS HELD BY QUEBEC RUBBER GROUP

The Quebec Rubber & Plastics Group, which is now operating as an autonomous organization since the Montreal Section of the Society of Chemical Industry was absorbed by the recently-organized Chemical Institute of Canada, has held three meetings within recent weeks. These were held on October 12, October 22 and November 9, respectively, and all three were held in the Ritz-Carlton Hotel in Montreal.

The principal speaker at the October 12 meeting was H. F. Boorn, of the United States Rubber Co., who discussed "The Use of Market Research in Business." Mr. Boorn defined market research as a method or technique which, when applied to the basic principles of research, provides an objective conclusion regarding sales and allied problems. As an example of the usefulness of such technique worked out by industry, he cited the way the victorious Allies used it in logistics, i.e., getting the right product to the right place at the right time. He concluded with the statement that market research properly applied often means the difference between a profitable operation and a costly mistake.

The meeting held on October 22 was a special meeting called to give members and guests an opportunity to hear J. Wilson, Director of Research of the British Rubber Producers' Research Association, currently on an extended visit to the United States and Canada. Mr. Wilson first discussed the creation of the B.R.P.R.A. and its counterparts in Holland and France and then outlined the advantages of natural rubber from the standpoints of tack, tensile and elasticity over synthetic polymers, pointing out that these characteristics were due to the structure of the polymers. In the course of his address Mr. Wilson ventured the opinion that no major improvements in the synthetic polymers would be realized as they are at present without starting at the beginning and developing new types or new methods of controlling the polymerization reaction.

A talk on "The Practical Aspects of Railway Research and Development," by S. W. Fairweather, vice-president in charge of research and development of the Canadian National Railways, was the feature of the meeting held on November 9. The speaker discussed some of the improvements accomplished by the railway industry in the past twenty years, all of which have resulted in lower passenger and freight costs. This meeting, which was attended by approximately 100 members and guests, was under the chairmanship of E. D. Bent.

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Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., was recently awarded a third white star, indicating continued production efficiency on government contracts.

## Wright Named Vice-President

Carl J. Wright

Carl J. Wright, general manager of the General Atlas Carbon Co., a subsidiary of Godfrey L. Cabot, Inc., and one of the pioneer producers of furnace blacks for rubber compounding, has been elected vice-president and general manager of that company. Since 1922, Mr. Wright, as a member of the staff of Henry L. Doherty & Co., Inc., had been in charge of the development of the General Atlas process for producing semi-reinforcing blacks.

After graduation from Rensselaer Polytechnic Institute in 1913 with a degree of Electrical Engineer, Mr. Wright was employed as an engineer by the Denver Gas and Electric Company, a subsidiary of Cities Service Company. Until 1922, he was transferred frequently; first to New York, then to Glenwood, Ontario; to Wichita, Kansas; to Caney, Kansas; to Toledo, Ohio; to Washington, Pennsylvania. These transfers were connected with the work for Henry L. Doherty, generally on some engineering projects in which Mr. Doherty was personally interested. After 20 years at the New York headquarters of General Atlas, Mr. Wright moved to Pampa, Texas, the site of the first General Atlas Furnace Black plant.

Mr. Wright is an ardent fresh water fisherman and a hobbyist capable of building his own split bamboo fly rods, or building remarkable inlay pictures from imported woods.

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Thalid XR-540, which is said to be the first commercially available impression molding resin to provide plastics-glass cloth laminates which are self-extinguishing and do not support combustion, has recently been announced by Monsanto.

## PLASTICS SESSION FEATURES DETROIT GROUP'S MEETING

The second Fall meeting of the Detroit Rubber & Plastics Group, Inc., held on October 30 at the Detroit-Leland Hotel, in Detroit, Mich., and attended by approximately 100 members and guests, featured plastics. A paper on "Progress in the Development of Laminates" was presented by Harry Kline, manager and technical director of the Phenolic Plastics Division of Reichhold Chemicals, Inc., while a sound-color movie, entitled "The Story of Formica," was shown through the courtesy of the Formica Corporation. Samples of molded laminates were also displayed by Reichhold, Formica, Fabricon Products, Inc., and the Plastics Laboratory of Wayne University.

In his talk, Mr. Kline traced the history of laminate production from the introduction of Bakelite in 1910 through 1944, when 120,000,000 pounds of phenolic molding material and 96,000,000 pounds of laminating varnishes were produced. The laminating process consists essentially of passing the fibrous material through a bath of resin in solvent, followed by oven drying to remove solvent and control flow properties of resin. Layers of the dried and cut materials are molded by various methods at elevated temperatures and pressures. Development of impregnating machines, presses and resins were described, with discussion of resin limitations.

Raw materials for resins and fillers were discussed with regard to ultimate physical and chemical properties obtained. Use of substitutes for phenol show promise in improved properties and rate of cure. Paper laminates were compared with canvas laminates, wherein the former are superior in electrical properties, lower in cost but inferior in impact strength in the edgewise direction. Paper-plywood combinations combine good properties, such as water resistance and good tensile of paper, with good impact strength of plywood.

Recent developments include: (1) low pressure molding resins, (2) high tensile papers, (3) molded laminates using (a) platens and (b) bag method in the hat type press or autoclave, (4) post-forming of cured laminates using heat and pressure, and (5) fast curing resins and improvements in low pressure phenolic resins. Molding methods and types of articles molded were illustrated by slides.

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## Monroe Purchases New Plant

The Monroe Auto Equipment Co., Monroe, Mich., recently purchased a large, new plant in Hillsdale, Mich., which it intends to use for the production of new hydraulic easy-ride truck seats and for the compounding and molding of rubber and synthetics. In addition to the Hillsdale plant, which represents the largest single step in its expansion program, the company has also acquired a new plant in Monroe and has expanded its main factory.

## ONTARIO RUBBER SECTION HEARS TALK BY G. BENSON

The first fall meeting of the Ontario Rubber Section of the Chemical Institute of Canada was held on October 25 at the University of Toronto, Toronto, Ont., Canada. Approximately 60 members and guests attended. The feature of the meeting was a talk on "The Manufacture of Acetylene Black and Its Uses in Natural Rubber, GR-S and GR-I" by G. Benson, director of plant research of Shawinigan Chemicals, Ltd., Shawinigan Falls, Que., Canada.

Mr. Benson began his talk by outlining the history of acetylene black production and the methods used in producing Shawinigan black. He then described the characteristics and uses of this black. Shawinigan black, he explained, is a medium-sized black with a pronounced chain formation. When compounded in GR-S, it gives a high modulus, higher Shore hardness and slightly lower tensile than is normal, considering its particle size, and its abrasion and growth resistance are good. In general it resembles an HMF black, such as Philblack or Statex 93. Heat build-up, as measured by the Goodrich flexometer, is somewhat higher for Shawinigan black, and the Hi-Flo black which is made by Shawinigan is better than its standard black in this respect. Hi-Flo, Mr. Benson explained, is an experimental black produced by a modification of normal operating conditions.

In GR-S, Shawinigan black, apart from its high electrical conductivity, behaves like an HMF black, the speaker said, but it has better tear resistance than HMF blacks at low loadings, and its flex-crack resistance is about the same as other blacks.

### *Finds Application in GR-I*

In GR-I, Mr. Benson continued, acetylene black has good abrasion and resistance to flow. The reduction in plastic flow, good modulus and abrasion resistance make its use in Butyl stocks worthy of further investigation. The standard grade, he added, is preferable to the Hi-Flo type for use in such stocks. In natural rubber, acetylene black has been used extensively where good electrical conductivity is required. This high conductivity is related to the preservation of the chain structure and mechanical treatment which is likely to break these chains should be kept to a minimum if high conductivity is to be maintained. In respect to physical properties, acetylene black behaves very similarly to HMF blacks in natural rubber, as well as in GR-S, the speaker concluded.

During the talk, electron micrographs were shown to illustrate the high structure of acetylene black as compared with other commercial carbon blacks, and slides were employed to demonstrate that the heat conductivity of acetylene black is about twice that of regularly used blacks.

### Odd Use for Gaskets

The Chicago branch of the Office of Surplus Property, since succeeded by the War Assets Corporation, is faced with the disposition of some 2,000,000 neoprene gaskets for Wasp aeronautical engines. Demonstrating unusual marketing ingenuity, the branch has prepared a special brochure designed to convince milliners that the gaskets could be utilized as trimming fasteners, flower bandeau and bracelet foundations. No report is available as to the success of the offer.

### Compounding of Perbunan

An interesting article on the compounding of Perbunan, including data on the effect of petroleum plasticizers on Perbunan 18, appears in the October, 1945, issue of *Esso Oilways*, house organ of the Standard Oil Co. A comparison of Nuso 55 and a light processing oil in a Perbunan 18 stock is also shown. Copies of the issue may be obtained by writing the Standard Oil Co., Room 1600, 26 Broadway, New York 4, N. Y.

### Chicago Plans Xmas Party

The Chicago Rubber Group will hold its Fifth Annual Christmas Party on Friday, December 21, at the Morrison Hotel, Chicago, Ill. This annual event is the highlight of the group's season of activities, since it is the only meeting of the year to which the members' wives are invited. As usual, each lady will be presented with a gift as a souvenir of the party. Reservations should be made with the secretary of the group, William N. Crumpler, 400 West Madison St., Chicago 6, Ill.

### Detroit to Hear Jones

The Annual Christmas Party of the Detroit Rubber & Plastics Group, Inc., will be held on Friday, December 14, at the Detroit-Leland Hotel, Detroit, Mich. A dinner will precede the meeting. The speaker for the evening will be Dr. Webster N. Jones, director of the College of Engineering of the Carnegie Institute of Technology, who will discuss the various aspects of engineering education as related to industry. Officers for 1946 will be elected at this meeting.

### Rhode Island Holds Meeting

The Rhode Island Rubber Club held a dinner meeting on November 16 in the Empire Room of the Crown Hotel, Providence, R. I. The feature of the occasion was an entertainment program of "Famous Faces," presented by Murl Daniels. No technical talk was included in the program.

## NEW YORK GROUP HEARS HIGH FREQUENCY TALKS

Approximately 300 members and guests attended the second Fall meeting of the New York Rubber Group, held at the Building Trades Club, in New York City, on November 2. The program featured two interesting talks, one on "The Application of High Frequencies to Heating and Vulcanizing Rubber," by Verne L. Smithers, head of the V. L. Smithers Laboratories, of Akron, Ohio, and the other on "Electronics in Industry," by T. P. Kinn, supervisor of industrial electronics of the Westinghouse Electric Corp. In addition, one of the most amusing after-dinner talks heard by the group was delivered by Gene Flack, director of advertising of the Loose-Wiles Biscuit Co., who has well earned his title of "Sunshine Gene."

During the course of the meeting, Chairman Harry Outcault (St. Joseph Lead), announced that the group now has approximately 730 paid members. He also stated that guest tickets will not be available for the Christmas Party and tickets would be available only to paid-up members. A Nominating Committee to present a slate of officers for election at the next meeting was named, consisting of T. A. Bullifant (Barrett), Otto Lang (Armstrong Rubber), and Sam Martin, Jr. (Thiokol).

The talks given by Messrs. Smithers and Kinn were similar to those previously given before local rubber groups and scheduled for presentation in the next few months before other groups, these talks being designed to acquaint members of the industry with the latest developments in the field of high frequency vulcanization.

Mr. Smithers, the first speaker, discussed the elementary fundamentals of high frequency application, and outlined its early history, from the development of the radio tube, the work of Edison, Fleming and Deforest, up through that of Leduc and Dufours, who developed the principle for the vulcanization of rubber. He mentioned the fact that high frequency vulcanization was already being employed in the manufacture of foamed latex mattresses and other products, and predicted that it would eventually be adapted to tire manufacture, once certain existing problems, such as the determination of suitable mold materials, are solved. He also presented some physical test data on test specimens vulcanized by both ordinary vulcanizing methods and the new high frequency vulcanization method.

The second speaker, Mr. Kinn, explained the theory of dielectric heating and delivered a comprehensive talk on the entire subject of high frequency application, illustrating his talk with numerous slides. At the conclusion of the talks, both speakers were besieged with questions from the floor, indicating the keen interest being displayed by the industry in the new vulcanization process.

## R.M.A. ISSUES REPORTS ON PERFORMANCE OF SYNTHETICS

That synthetic rubber has now permanently established itself as a basic new world raw material, and that American-made synthetic rubbers have proved themselves definitely superior to any other raw material in scores of products apart from tires and the new Butyl rubber inner tubes, were the conclusions reached in two reports recently issued by A. L. Viles, president of the Rubber Manufacturers Association, New York City. These conclusions were based on an RMA survey of the country's principal makers, processors, testers and users of synthetic rubbers, which was designed to measure the performance of synthetics between the time that Japanese conquest of the Far East forced the United States into production and use of synthetic rubbers and V-J Day.

In his first report, which was confined to the Association's study of the field of tires and tubes, Mr. Viles said that because of its exceptional capacity for retaining air GR-I is now used to produce inner tubes superior to any built in the history of the rubber manufacturing industry, and predicted that it will continue to be our No. 1 tube material. Referring to tires, he said that the industry has developed the synthetic rubber passenger tire to the point where it compares closely in performance with the average pre-war tire and that there have been substantial improvements in the truck tire.

Further, he pointed out, research has so far been chiefly devoted to large-scale production of synthetic rubber, compounding, plasticizing, and other aspects of processing. Relatively little attention could be given under these circumstances to improving the polymer itself. With research now freed to seek new and better polymers, there is sound basis for the belief that new synthetic rubbers with broader fields of use and service are on the way.

Among the promising new synthetic rubbers already in development, the chlorostyrene group, a modified GR-S type, is building impressive records in early laboratory tests. Actually research has barely crossed the threshold of the field of new synthetic rubbers, Mr. Viles said.

Speaking of the continued higher cost of GR-S than that of natural rubber, he said that alcohol butadiene is giving way rapidly to the lower cost petroleum base butadiene, which is now being used in some of the most efficient government plants to manufacture synthetic rubber for considerably less than was paid for natural rubber just before the war.

In his second report, which covered synthetic rubbers in such products as heels and soles, hard rubber, drug sundries, footwear, and such mechanical goods as belting, air and oil hose, sheet packing, gaskets, vibration dampeners, pipe coupling rings, and extruded and molded goods, Mr. Viles stated that wartime performance has demonstrated that many products will continue to use synthetic rubbers regardless of cost differentials because of special properties as yet unmatched in any other raw materials.

This is specifically true in the case of complicated aviation magnetoes, hard rubber lining for pipes, valves and pumps used in the rayon industry, in hose and mechanical goods exposed to the deteriorating effects of petroleum products, high quality ebonite products, in many extruded goods, and in certain lines in the rubber heel and sole industry where high style and long wear are critical factors.

Chief among these rubbers, he said, are GR-S, GR-I, and GR-M. The properties which make them especially desirable in the special applications mentioned above are resistance to heat, resistance to abrasion, resistance to corrosives, resistance to deterioration on exposure to petroleum products, and resistance to deterioration on exposure to sunlight.

## Philblack Appoints Popp

George E. Popp

George E. Popp, formerly production superintendent of the Inland Rubber Corp., Chicago, Ill., was recently appointed by the Philblack Division of the Phillips Petroleum Co., as technical representative for the western territory, with headquarters at 3666 Archer Ave., Chicago 9, Ill. Mr. Popp is a native of Colorado and attended Colorado University Extension. For 14 years he was employed by the Gates Rubber Co., Denver, Colo., where he gained diversified experience in the factory, reclaim, and technical divisions prior to becoming manager of the tire, tube and repair materials division in 1938. In February, 1943, he left his position with Gates to join Inland Rubber.

## TIRE PRODUCTION REPORTS COVER TWO-MONTH PERIOD

Reports covering tire and tube production for both August and September have been issued in recent weeks by the Rubber Manufacturers Association. The reports indicate that whereas increases were recorded in August, due to conversion activities on the part of the manufacturers, some decreases were recorded in September, due largely to heavy cancellations of military orders, reconversion difficulties, production stoppages due to labor problems, and the continuing manpower shortage.

Production of passenger car casings rose from 1,938,650 units in July to 2,485,634 units in August, an increase of 28.2%. Production of such casings in September amounted to 2,600,089, an increase of 4.6% over August. Inventories at the end of July, August and September of passenger car casings were set at 1,016,615, 1,246,012, and 1,291,836 units, respectively.

Production of truck and bus casings advanced 4.9% in August, rising from 1,115,510 in July to 1,170,364 units in August, but was cut sharply in September, falling to 831,820 units, a drop of 28.9% from the August figure. Inventories of truck and bus casings amounted to 782,877, 825,942, and 711,250 units at the end of July, August and September, respectively. The combined figures showed a total production of casings of 3,054,160 in July, 3,655,998 in August, and 3,431,909 in September.

Production of passenger car, truck and bus tubes showed a gain of 6.2% over July, and a drop of 5.5% in September as compared with August, the figures being 3,049,595 units in July, 3,239,936 in August, and 3,061,449 in September. Inventories stood at 2,597,167 at the end of July, 2,783,814 at the end of August, and 2,707,621 at the end of September. These reports cover only automotive pneumatic casings and tubes, and do not include any solid rubber tires or pneumatic tires for motorcycles, bicycles, or for aviation, agriculture, or industrial equipment.

### Tire Plants on Block

Several of the completed and near-completed tire factories constructed and reconverted during the government's emergency tire program have been offered for sale in recent weeks by the Reconstruction Finance Corporation, although no completed sales of any kind have yet been reported. Included among the plants offered were the truck tire plant at Tuscaloosa, Alabama, which was to be operated by Goodrich; the tire plant at Natchez, Miss., consisting of approximately 56,000 square feet, which was to have been operated by the Armstrong Tire & Rubber Co., and the plant of the Jacobs Aircraft Engine Co., at Pottstown, Penna., which was being reconverted to the manufacture of truck tires, and which was to have been operated by Firestone.

## GR-S-BLACK DISCUSSION HEARD BY BOSTON GROUP

Approximately 300 members and guests attending the Fall Meeting of the Boston Rubber Group, held on September 28 at the Copley Plaza Hotel, in Boston, Mass., heard an interesting discussion on "The GR-S Masterbatch Process" presented by Dr. J. H. Faull, Jr. Dr. Faull is head of polymer research for the General Latex & Chemical Co., Cambridge, Mass., and is currently technical superintendent of the Baytown, Texas, polymer plant operated for the government by the General Tire & Rubber Co. In addition to this technical paper, a talk on "Thirty-Seven Thousand Miles in the Pacific" was given by Cedric Foster, well-known Boston columnist.

In his talk Mr. Faull called attention to the commercial achievement whereby a new combination of raw materials has been made available to manufacturers of rubber goods and reviewed the advantages already realizable in the use of GR-S black with comments on current improvements. He also discussed some of the future possibilities for the benefit of potential users requiring special formulations unobtainable without such a masterbatch.

The following tested advantages, Mr. Faull pointed out, are realized from GR-S black masterbatches latex mixed: (1) Rubber and black shipped together in a clean, easily handled package; (2) Rubber factories experience reduced processing time; (3) Storage and warehousing is improved because the packages show greatly decreased cold flow; (4) Factories with limited black mixing equipment are benefited; and (5) Opportunities exist for using GR-S not otherwise usable. An example is low viscosity material.

Mr. Faull revealed that since August, 1944, the GR-S copolymer plant has been in virtually continuous production of GR-S black latex mixed masterbatch (most of it distributed as GR-S Black No. 1) for the Office of Rubber Reserve, Reconstruction Finance Corporation, and through the agency of the General Tire & Rubber Co., Synthetic Rubber Division, of which General Latex & Chemical Corp. of Cambridge, Mass., is a management participant. In excess of 50,000,000 pounds masterbatch containing two-thirds GR-S have been produced and consumed by the rubber industry.

According to Mr. Faull, at present GR-S Black No. 1 is the standard type containing 33% EPC black with improved processing characteristics and reduced moisture content. A new type, X-228, is available, of particular interest to those desiring maximum processing advantage with minimum or no physical property changes. The viscosity of contained GR-S is just under 40 rather than 50 Mooney.

The talk was illustrated by slides showing process equipment used at Baytown and tables of product quality.

## NEW POLYMERS AUTHORIZED BY OFFICE OF RUBBER RESERVE

Listed below are types and properties of new experimental GR-S polymers (including GR-S latices) which have been authorized by the Office of Rubber Reserve, Reconstruction Finance Corporation, since publication of those listed in our preceding issue. Procedures for the distribution and sale of these experimental polymers will be found in the same issue.

| *"X" Number* | *Date of Authorization* | *Manufacturing Plant* | *Polymer Description* |
|---|---|---|---|
| X-249 | Oct. 8, 1945 | Goodyear—Akron | Continuous GR-S shortstopped with 0.05 sodium sulfide and 0.05 hydroquinone. |

The following polymers are being made particularly for a large-scale tire test program to explore the possibility of quality improvement through lowered polymerization temperature, lowered conversion, or both.

| | | | |
|---|---|---|---|
| X-251 | Oct. 11, 1945 | U.S. Rubber—Institute | GR-S type polymerized at 115°F. and carried to 72% conversion. |
| X-252 | Oct. 11, 1945 | U.S. Rubber—Institute | GR-S type polymerized at 115°F. and carried to 65% conversion. |
| X-253 | Oct. 11, 1945 | U.S. Rubber—Institute | GR-S type polymerized at 104°F. and carried to 72% conversion, activated. |
| X-254 | Oct. 11, 1945 | U.S. Rubber—Institute | GR-S type polymerized at 104°F. and carried to 72% conversion, non-activated. |
| X-255 | Oct. 11, 1945 | U.S. Rubber—Institute | GR-S type polymerized at 122°F. and carried to 72% conversion, control. |
| X-256 | Oct. 11, 1945 | Goodrich—Port Neches | GR-S type 10 polymerized at 115°F. and carried to 72% conversion. |
| X-257 | Oct. 11, 1945 | Goodrich—Port Neches | GR-S type 10 polymerized at 115°F. and carried to 65% conversion. |
| X-258 | Oct. 11, 1945 | Goodrich—Port Neches | GR-S type 10 polymerized at 104°F. and carried to 72% conversion, activated. |
| X-259 | Oct. 11, 1945 | Goodrich—Port Neches | GR-S type 10 polymerized at 104°F. and carried to 72% conversion, non-activated. |
| X-260 | Oct. 11, 1945 | Goodrich—Port Neches | GR-S type 10 polymerized at 122°F. and carried to 72% conversion, control. |
| X-261 | Oct. 11, 1945 | Goodrich—Port Neches | GR-S type 10 polymerized at 115°F. and carried to 60% conversion. |
| X-262 | Oct. 11, 1945 | Firestone—Akron | GR-S type 10-AC polymerized at 115°F. and carried to 72% conversion. |
| X-263 | Oct. 11, 1945 | Firestone—Akron | GR-S type 10-AC polymerized at 115°F. and carried to 65% conversion. |
| X-264 | Oct. 11, 1945 | Firestone—Akron | GR-S type 10-AC polymerized at 104°F. and carried to 72% conversion, activated. |
| X-265 | Oct. 11, 1945 | Firestone—Akron | GR-S type 10-AC polymerized at 104°F. and carried to 72% conversion, non-activated. |
| X-266 | Oct. 11, 1945 | Firestone—Akron | GR-S type 10-AC polymerized at 122°F. and carried to 72% conversion, control. |

| | | | |
|---|---|---|---|
| X-267 | Oct. 11, 1945 | Firestone—Akron | GR-S type 10-AC polymerized at 122°F. and carried to 77% conversion, control. |
| X-268 | Oct. 12, 1945 | Goodyear—Akron | Regular GR-S with the exception of the temperature which is considerably lower; normal conversion. |
| X-269 | Oct. 12, 1945 | Goodyear—Akron | GR-S-38 with considerably lowered temperature and conversion. |
| X-270 | Oct. 16, 1945 | Firestone—Akron | Formulation similar to GR-S-X-231; 50-55% total solids, no antioxidant, contains non-staining shortstop tuads; manufactured in large-scale batches. |

### Hewitt Buys New Plant

The Hewitt Rubber Corp., Buffalo, N. Y., has purchased a large plant, recently used as a Navy materiel redistribution center, adjacent to its headquarters on Kensington Ave., for expanded production of new peacetime products. The plant, which is of steel, brick and concrete construction, consists of three main buildings, an office building, and a boiler plant, having an overall floor area of 112,000 feet. Approximately $200,000 was paid for the property, and the company expects to spend an additional $150,000 for reconditioning and $350,000 for new machinery. The new plant, which is expected to get into production early in 1946, will be used for production of Hewitt's new line of latex foam rubber items, particularly mattresses and automobile seat cushions, an expanded line of molded rubber goods, including new products manufactured by the injection molding system, and increased production of industrial hose. Included among new machinery the company recently ordered in connection with its expansion program are a Chrysler injection molding machine, a company-designed injection molder, expected to introduce an entirely new injection molding process, and five additional high-speed automatic compression molding presses, all convertible to injection molding.

### Issue Rayon Cord Folder

Signalizing the launching of an advertising campaign in newspapers throughout the country on the advantages of rayon cord tires, the Industrial Rayon Corporation is forwarding an attractive 12 x 16-inch promotional folder, made of rayon pulp, to some 300 administrative, sales, and merchandising executives in the tire field. The folder contains a letter from Hiram S. Rivitz, president of the company, a specimen advertisement, and a booklet which describes the process employed by the company to produce rayon cord for tires. The folder is tied with a double length of tire cord made from rayon pulp.

### Open Merchandising Laboratories

The Visual Merchandising Laboratories of the Goodyear Tire & Rubber Co., designed to aid the company's dealers along the lines of store planning and display, were formally opened in Akron on October 30 with a two-day visit by leading business and merchandising writers. Addresses were made by various company executives, including E. J. Thomas, president, and J. E. Mayl and R. S. Wilson, vice-presidents. The laboratories incorporate three full-size stores, complete with fixtures, products, exterior identification, and other factors. One model is that of a service station, another is a small tire dealer establishment, and the third is a large tire dealer establishment. A feature of the laboratories permits visiting Goodyear tire dealers to reorganize, modernize and increase the efficiency of their existing store layouts with the aid of the laboratory staff and with utilization of miniatures of store equipment and fixtures.

### New York Plans Xmas Party

The Annual Christmas Party and Meeting of the New York Rubber Group will be held this year on Friday, December 14, at the Hotel McAlpin, in New York City. Tickets, at $3.50 each, will be restricted to paid-up members of the group. As usual, the meeting will be devoid of technical talks, and will feature novel entertainment and the distribution of prizes to holders of lucky number tickets. Tickets can be secured from the secretary of the group, B. B. Wilson, c/o *India Rubber World*, 386 Fourth Ave., New York 16, N. Y.

### Form Dayton Export Company

Formation of the Dayton Rubber Export Company, the principal function of which will be the handling of the export business of the Dayton Rubber Manufacturing Co., was recently announced. The new concern, which will have its headquarters at Dayton, Ohio, was authorized to issue 500 shares of no par stock and to have a capitalization of $25,000.

### PACE COTTON COMMITTEE DEFENDS COTTON CORD USE

Cotton cord in passenger car tires withstood all recent government tests and was in good condition after 60,000 miles of high-speed driving, according to a report tendered to the National Cotton Council at Memphis, Tenn., on November 12, by the so-called Pace Cotton Committee. The committee, which is studying cotton industry problems, is under the chairmanship of Representative Stephen Pace, Democrat, of Georgia.

Conducted by the Rubber Reserve Company in cooperation with the Bureau of Agriculture and Industrial Chemistry of the Department of Agriculture, the tests also included comparisons made on light trucks of standard cotton cord, rayon cord and cotton cord made from improved varieties of cotton. They were conducted at San Antonio, Tex., on the Federal Government's tire test fleet.

The Pace committee emphasized that the test did not bear out recent advertisements claiming that rayon was superior in all types of tires. In addition, tests showed a much better cotton cord can be produced by the use of improved varieties of cotton, the research group added.

Passenger car tests were discontinued, the committee said, after cotton cord tires driven at sixty miles an hour had outworn their original treads and a recap tread, and were still in good enough condition for another recapping.

The committee reported that a group of rayon tires driven in the truck test gave 16 per cent more mileage than the improved cotton tires but this was attributed to the type of tire construction rather than to any fiber quality since no fabric failures occurred in either group.

The improved cotton cord was selected by the Southern laboratory of the Department of Agriculture after it had performed outstandingly in a series of tests conducted by the Army on military vehicles at Normoyle, Tex.

### Compar in Mark 14 Gunsight

One of the secret weapons used to smash Japanese air attacks on the American fleet has now been revealed as the Mark 14 Gunsight.This device, developed by the Massachusetts Institute of Technology and the Sperry Gyroscope Co., provided unremitting control, permitting guns to be accurately aimed at high speed targets, by computing the rate of speed of such targets by means of gyroscopes. A prime requisite for perfect performance of the gunsight was an immaculate system for carrying the compressed air that spins the gyros, and compar tubing, a product of the Resistoflex Corp., Belleville, N. J., was adopted for this purpose. The tubing had to meet three basic specifications: (1) It had to be made of a material that would not slough off and clog tiny orifices; (2) It had to preclude the possibility of the entrance of water or oil vapors; and (3) It had to retain flexibility in temperatures as low as —20° F.

# NAMES IN THE NEWS

HOWARD E. WINGET, who has been associated with the Goodyear Tire & Rubber Co., Akron, for 20 years, most recently as a representative of the subcontract division at Wooster, Ohio, has left that company to take the position of assistant superintendent of the Wooster Rubber Co.

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RALPH JOHNSON, foreman of the Ohio Rubber Co., Willoughby, Ohio, has been promoted to the position of manager of the molded goods division.

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R. W. MITTEN, who was formerly employed by the B. F. Goodrich Co., Akron, and by the Davidson Rubber Co., Charlestown, Mass., has joined the staff of Stanco Distributors, Inc., as a field representative working out of Akron.

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JOSEPH MERSEY, who has served the Ohio Rubber Co., Willoughby, Ohio, for 11 years as production control manager, has been assigned to the company's Rochester, N. Y., territory as sales representative.

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WAYNE BRINKERHOFF, manager of technical data service, B. F. Goodrich Chemical Co., Cleveland, Ohio, has been named advertising manager of the company.

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LT.-COL. LEONARD SMITH has joined the National Cotton Council, Memphis, Tenn., as director of its scientific research section, in which position he will have charge of research activities and liaison work with other laboratories studying cotton and cottonseed uses.

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RUDY V. GANZ, who has served as a designer and modeler with the Shawnee Pottery Company, Zanesville, Ohio, for the past eight years, has joined the Edmont Manufacturing Co., Coshocton, Ohio, as an industrial designer.

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D. W. WALSH, who has been associated with the U. S. Rubber Co. since 1931, most recently as sales manager of the U. S. Tires Division, has been appointed Pacific Coast sales manager of the Division, with headquarters in Los Angeles, Calif.

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RICHARD G. CONANT, vice-president of the Wellington Sears Co., Inc., New York City, has been elected president of the company, succeeding CHARLES A. SWEET, who has resigned.

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WALTER D. BALDWIN, merchandising manager of the U. S. Tires division of the U. S. Rubber Co., with which he has been associated since 1934, has been named sales manager of the division.

JAMES D. PERLEY, who served as personnel director of the National Dairy Co. before he entered the Army in 1941, has been appointed director of industrial relations of all plants of the General Tire & Rubber Co., Akron, succeeding H. L. BARNES.

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DR. EDWARD U. CONDON, an expert in the development of the atomic bomb, rockets and radar, has been named director of the National Buerau of Standards, Washington, D. C., as successor to DR. LYMAN J. BRIGGS, who is retiring.

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HARRY W. GLEICHERT, assistant director of sales of the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh, Penna., has been named director of sales for the Division.

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W. H. KNEASS, manager of commercial merchandising of the U. S. Tires Division of the U. S. Rubber Co., has been appointed Pacific Coast manager of the Division, with headquarters in Los Angeles, Calif.

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FREDERICK G. SCHRANZ, formerly vice-president of the Baldwin Southwark Division of the Baldwin Locomotive Works, Philadelphia, Penna., and head of the hydraulic engineering department of R. D. Wood & Co., has opened his own consulting engineering office at 90 West Broadway, New York, N. Y.

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MAJ. N. A. GLANTZ, rubber coordinator of the Air Technical Service Command, Wright Field, Ohio, has been appointed AAF representative on the working group of the Inter-Agency Policy Committee on Rubber which was recently created by the Office of War Mobilization.

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GEORGE W. FLANAGAN, formerly in charge of Geon latex development for Goodrich, has been made manager of the development laboratory of the B. F. Goodrich Chemical Co., Cleveland, Ohio.

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DR. EARL W. FLOSDORF, formerly assistant professor of bacteriology in the Medical School of the University of Pennsylvania, has been appointed director of research and development of the F. J. Stokes Machine Co., Philadelphia, Penna.

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CHARLES H. LOVE, who recently served as chief of the Pigment & Color Section of the Chemicals Bureau of WPB, has returned to C. K. Williams & Co., Easton, Penna., as assistant to the executive vice-president. MR. LOVE was associated with the Williams company from 1929 to 1942 in connection with research and sales.

MAJOR ALBERT K. DANNENBAUM, who has served in the Research and Development Division of the Philadelphia Quartermaster Depot for over three years as Officer-in-Charge of the Plastic and Coating Section, and who was recently tendered a testimonial dinner by the Rubber Manufacturers Association for his work in that connection, has been released from the service and has resumed his civilian status as president of the Aldan Rubber Co., Philadelphia, Penna.

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ROBERT G. ALLEN, who joined the Baldwin Locomotive Works as general manager of the Baldwin Southwark Division in March, 1945, after serving with the U. S. Army since July, 1942, has been appointed general sales manager of the Baldwin Locomotive Works.

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V. L. FOLLO, associated with the Goodyear Tire & Rubber Co. for many years, serving as division superintendent of the Gadsden, Alabama, plant for nine years at one time, has been named superintendent of the company's new plant at Uitenhage, South Africa.

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LT. COL. FOSTER STEWART, formerly advertising and sales promotion manager of the tire division of the U. S. Rubber Co., has rejoined the company as head of distribution planning for the tire division, after serving for three years overseas with the AAF.

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JOSEPH MANGION, formerly laboratory director of the Alfred Hale Rubber Co., North Quincy, Mass., has been placed in charge of the rubber laboratory of Arthur D. Little, Inc., Cambridge, Mass.

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COMM. A. ERNEST MACGEE, officer in charge of the chemistry section of the research and standards branch of the U. S. Navy Bureau of Ships during the war, has returned to the Skelly Oil Co., Kansas City, Mo., as head of its solvents department.

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R. C. MURRAY has left the Nic-Co Rubber Co., Connellsville, Penna., to accept the position of general manager of the Casto Co., Parkersburg, W. Va.

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JOHN W. MOCK, lecturer and writer on salesmanship and sales psychology, and until recently sales manager of the Turner Brass Works, has been appointed sales manager of the Protectoseal Co., Chicago, Ill.

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H. S. LIDDICK, formerly factory manager of the Sponge Rubber Products Co., Derby, Conn., has joined the Davidson Rubber Co., Charlestown, Mass., as technical superintendent.

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ROBERT P. KENNEY, formerly manager of international service of the B. F. Goodrich Chemical Co., Cleveland, Ohio, and who previously served as chief of the vinyl resins unit of WPB, has been named manager of the company's international sales.

### Joins Naugatuck Sales Group

Stephen H. Tyng

Stephen H. Tyng, formerly of the Institute, W. Va., synthetic rubber plant operated by the United States Rubber Company, has been appointed to the technical sales organization of the company's Naugatuck Chemical Division handling latex, Lotol, dispersions and latex chemicals. He will make his headquarters at the company's Boston office, 560 Atlantic Avenue, Boston, Mass., and will cover the New England area. Mr. Tyng is a former resident of Boston, Mass. He attended the Roxbury Latin School and received his A.B. from Harvard in 1935 in the field of mining geology and chemistry. In 1936 he took his M.A. in mining engineering. After some years as head of the science department and director of athletics at the Lenox School, Lenox, Mass., Mr. Tyng became associated with U. S. Rubber in 1942. For two years he was in production supervision at the Williamsport, Pa., TNT plant operated by the United States Rubber Company and then was transferred to the Institute plant. Since May, 1945, Mr. Tyng has been in Naugatuck Chemical's New York sales office and at the plant at Naugatuck, Conn.

### Dinsmore Discusses Plastics

Some of the newer applications for plastics materials, particularly in the food packaging field, were outlined in an address before the Cleveland Chamber of Commerce at Cleveland on October 30 by Dr. R. P. Dinsmore, vice-president in charge of research of the Goodyear Tire & Rubber Co. Predicting that the American public will soon be enjoying a quality, freshness and flavor in a large variety of foods far beyond anything known in the past, Dr. Dinsmore also stressed the application of new plastics in other fields, such as adhesives, insulation, and lacquers. He made specific reference to various plastic-like materials developed by Goodyear, including Pliofilm and Pliofoam.

## FINANCIAL NEWS

### Johns-Manville Corporation

Nine Months Ended Sept. 30: Net profit of $3,897,481, after all charges, including $500,000 reserve for contingencies and $5,247,444 provision for taxes, which is equal to $4.49 a share of common stock, and which compares with $3,911,076, or $4.55 a common share for the first nine months of 1944, when $700,000 was provided for contingencies and $7,679,140 for taxes. Net profit for the three months ended Sept. 30 amounted to $1,038,867, or $1.13 a share, against $1,217,317, or $1.43 a share, for the third quarter of 1944. Sales of $21,149,098 for the third quarter of 1945 compare with $26,303,198 for the corresponding period of the previous year.

### Boston Woven Hose & Rubber Co.

Year Ended Aug. 31: Net profit of $426,889, after deduction of $943,000 for taxes, which is equal to $4.44 per share of common stock, and which compares with $341,893, or $3.45 per common share, for the previous fiscal year, when $357,700 was deducted for taxes. Gross sales for the year amounted to $11,387,266, which represents an increase of 16% over the $9,792,382 for the previous year. Total current assets of $6,284,520 compare with total current liabilities of $1,457,235, as of August 31, 1945.

### Columbian Carbon Company

First Nine Months: Consolidated net profit of $2,348,750, after a reserve of $1,950,000 for Federal taxes and renegotiation, which is equal to $4.46 a share, and which compares with $2,315,426, or $4.31 a share, for the corresponding period of the previous year, when $1,225,000 was reserved for taxes.

### General Cable Corporation

First Nine Months: Net income of $1,590,015, after provision of $8,065,000 for Federal income taxes, which compares with $1,700,232 for the first nine months of 1944, when $8,050,000 was provided for taxes.

### Belden Manufacturing Co.

First Nine Months: Net profit of $319,152, which is equal to $1.19 each on 265,300 shares, against $255,189, or $1.05 each on 241,547 shares, for the first nine months of 1944.

### Rome Cable Corporation

Third Quarter: Net profit of $149,671 which is equal to 90c a share, and which compares with $132,652, or 70c a share for the comparable period of 1944.

### Gro-Cord Appoints Menuez

Kyle L. Menuez

Kyle L. Menuez, who was formerly an associate partner with Fry, Lawson & Co., management engineers of Chicago and New York, has been named general manager of the Gro-Cord Rubber Co., Lima, Ohio. Before going into the management field, Mr. Menuez served for approximately 14 years in the rubber industry, having been associated with the Firestone Tire & Rubber Co., Akron, and the India Tyre & Rubber Co., Great Britain, Ltd. With Firestone, he served as an executive accountant in the mechanical goods division, devoting his time to manufacturing and cost controls for automotive equipment, special equipment processes and methods. With the British firm, he served as assistant to the managing director, with duties including financial planning, budgeting and control, selling price control, planning and development of manufacturing facilities. Mr. Menuez's earlier training and education were in the fields of engineering and accounting.

### Scrap Rubber Groups Meet

A joint meeting of the Scrap Rubber Institute and the Tire Patch and Reliner Manufacturers Association, both divisions of the National Association of Waste Material Dealers, Inc., was held at the Sherman Hotel in Chicago, Ill., on October 25. Alex Schulman, head of the firm bearing his name and president of the Scrap Rubber Institute, presided. Discussion at the meeting centered on the government regulation covering segregation of scrap rubber, interpretation of the ruling concerning shipments rejected because of improper segregation, and the need for more cooperation on the part of the government, particularly the State Department, in the matter of exporting scrap rubber. The joint meeting was held in conjunction with the Fall Convention of the N.A.W.M.D.

### Chicago Group Hears Smithers

The featured speaker of the meeting which was held by the Chicago Rubber Group at the Morrison Hotel, Chicago, Ill., on October 12, attended by approximately 225 members and guests, was Verne L. Smithers, president of the V. L. Smithers Laboratories, Akron, who gave a talk on "The Application of High Frequencies to Heating and Vulcanizing Rubber." Mr. Smithers reviewed the history of the subject and pointed out the advantages of this treatment, which, he said, include a saving in time, a more uniform product, and a product with better physical properties. He also spoke of experimental work which is currently being done on the application of the method to the curing of tires. Mr. Smithers was assisted by T. P. Kinn, an electronic engineer of the Westinghouse Electric Corp., Baltimore, Md., who covered the theoretical side of the subject and showed various types of equipment and typical rubber company installations. During the meeting, Dr. H. A. Winkelmann, director of research of the Dryden Rubber Co., Chicago, who is serving as chairman of the Group's Prize Contest Committee on "The Utilization of Synthetic Rubber Scrap," announced that no report from the judges of papers submitted is expected before the first of the year.

### Koresin Made Available

The availability of koresin in commercial quantities has been announced by the General Aniline and Film Corp., 230 Park Ave., New York City. Koresin, a tertiary butyl phenolacetylene condensation product, is the tackifier for synthetic rubber compounds which was being widely used in Germany during the war period. Data on its manufacture, properties and applications was secured by the special technical rubber mission sent to Germany some time ago, and the information secured was turned over to General Aniline which had been engaged in various developments calling for the use of high pressure and high temperature reactions of acetylene. The American-made product is said to appear to be identical with the German koresin and equally effective in compounding.

### Three Join United Carbon

Carl W. Snow, D. R. Wallace, and A. L. Sweigart, all formerly connected with the General Atlas Carbon Co. at Pampa, Texas, in the respective positions of chief chemist, laboratory technician, and research chemist, have joined the United Carbon Co., Charleston, West Virginia. All three will be stationed at the company's new laboratory at Borger, Texas, with Mr. Snow acting as research supervisor of both the laboratory and the recently-completed pilot plant. Mr. Snow has specialized in the manufacture of furnace process carbon blacks in recent years and is credited with a number of patents on the manufacture and pelleting of this type black.

### Lemon Wins Legion of Merit

Col. B. J. Lemon, a member of the tire development department of the U. S. Rubber Co., and who was in charge of the rubber branch at the Detroit, Mich., Office of the Chief of Ordnance during

*General G. M. Wells pinning the Legion of Merit on Col. B. J. Lemon.*

the war, has been awarded the Legion of Merit for outstanding contributions to the development of synthetic tires for military use. A native of Bethel, N. Y., and a graduate of Cornell University, with a Ph.D. in chemistry, Col. Lemon joined U. S. Rubber in 1915 as a member of the research and development department in New York. Transferred to Detroit in 1923, he remained there until 1933 and subsequently represented the company in Chicago, Ill., and Washington, D. C. In 1937 he returned to New York, where he remained until the outbreak of the war. At present he is located in the company's general offices in New York. Assigned to the OCO-D Development Division of the Army, he was responsible for much of the experimental research which resulted in successfully converting 65% of the Army's requirements for rubber to the use of synthetic materials. This included the development of synthetic rubber for use on all types of military wheel and track vehicles. Col. Lemon is a former chairman of the Detroit section of the Society of Automotive Engineers, a director of the Tire and Rim Association, and a member of Sigma Xi engineering fraternity.

A compact, light-weight, all-weather portable gasoline engine-driven generator which can be used in the Arctic regions or at the equator, at sea-level or at 30,000 feet, and in tanks, ships or planes, is being manufactured by the Homelite Corp., Port Chester, N. Y. A small resilient seal made of Hycar gasoline-resistant synthetic rubber makes a major contribution to the versatility and dependability of the generator unit.

### Offer New Polymer Course

The newest developments in the scientific investigation of the chemistry of high polymers and the recent practical applications of polymers in the plastics industry will be covered in a series of 15 seminars on alternate Saturdays, which started on November 3rd, under the auspices of the Bureau of Highpolymer Research of the Polytechnic Institute of Brooklyn. Half of the presentations will cover recent research on the preparation of new fibers, rubbers and plastics, and the other half will discuss improvements in the application of materials already known. This series on the Physics and Chemistry of Highpolymers has been arranged by Dr. Raymond M. Fuoss, one of the leaders in this field, who last year was appointed Sterling Professor of Chemistry at Yale University. The subjects chosen will complement the research and teaching in the field of fibers, plastics and rubbers which is going on at the Polytechnic Institute of Brooklyn and in which the Bureau of Highpolymer Research carried out important wartime contracts.

### Expands Chemical Division

Goodyear Tire & Rubber Co., Akron, recently announced several personnel changes involved in the current expansion of its Chemical Products Division. E. E. Ellies, a mechanical engineer widely experienced in development work, and Herman R. Theis, former assistant director of Goodyear research, are now serving as assistants to C. P. Joslyn, division manager, while Mr. Theis also serves as manager of the Plastics and Coatings Department. Other department managers include Howard D. Herbert (Airfoam Sales), Otto C. Pahline (Builders' Supply and Flooring), and A. F. Landefeld (Pliofilm Sales).

### Rubber Trade Group Elects

The board of directors of the Rubber Trade Association of New York, Inc., which maintains headquarters at 15 William St., New York 5, N. Y., at a meeting held in New York on November 13 unanimously re-elected G. Le Roy Scheinler as chairman of the board and Jacobus F. Frank as treasurer. R. D. Young, of course, continues as president, and B. G. Davy as secretary. Earlier, on November 9, Bancroft W. Henderson and David S. Kubie were elected as directors for the next three years for the dealers' group and Philip Billhardt for the brokers' and agents' group.

Electrically-conductive rubber, in the form of a pad less than 2 feet square, is being used to keep baby chicks warm in a new type of brooder developed for poultry raisers, according to U. S. Rubber. The new unit consumes less electricity than other heaters constructed with coiled wire.

# 3 NEW PETROLEUM CHEMICALS FOR THE RUBBER INDUSTRY

Phillips CHEMICALS

TERT-BUTYL MERCAPTAN

TERT-DODECYL MERCAPTAN

DI-TERT-BUTYL DISULFIDE

- For SYNTHETIC RUBBER POLYMERIZATIONS
- For RUBBER COMPOUNDING AND RECLAIMING

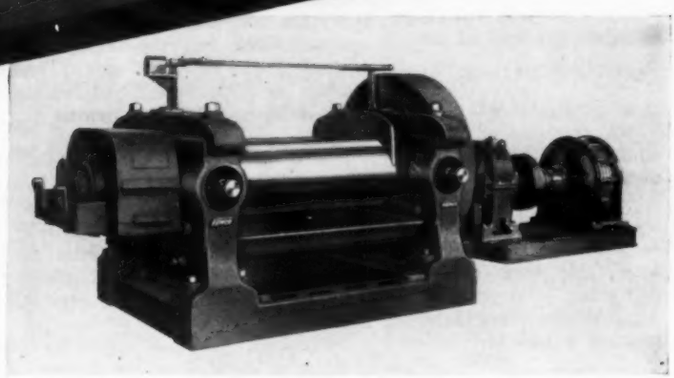
The above new Phillips Aliphatic Sulfur Chemicals show interesting possibilities for the rubber industry. All three are available in tank car quantities. For additional information on these petroleum chemicals, and others in the development stage, write for Bulletin 118.

**PHILLIPS PETROLEUM COMPANY**

*Chemical Products Department*

BARTLESVILLE, OKLAHOMA

# RUBBER & PLASTICS HEAVY DUTY MILLS



STURDY, dependable and built for long life, EEMCO Mills are made in standard sizes from the 12-inch Laboratory Mill up to and including an 84 inch Mill. Furnished as single units or for operation "in line" of two or more. Floor level drives are provided when wanted. Write EEMCO for your Rubber or Plastics Processing Machinery needs - - - early deliveries are now being made.

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953 EAST 12th ST., ERIE, PENNA.

# LOS ANGELES NEWS

Approximately 160 members and guests attended the regular monthly supper meeting of the Los Angeles Rubber Group, Inc., held at the Mayfair Hotel in Los Angeles on November 6. Highlighting the program was a talk by Arthur Ponsford, noted waterfront reporter, who discussed some of his unusual experiences. Another feature of the program was a colored motion picture of the Carlsbad Caverns, shown through the courtesy of the Santa Fe Railway. Prizes for the evening were donated by the Martin Mining Co., Pacific Molded Rubber Products Co., and Sierra Rubber Co. Considerable promotion for the forthcoming Christmas Theatre Party, to be held on December 4 at the Theatre Mart, where "The Drunkard" is now in its 13th year, was done at the meeting and a large number of guests were introduced.

Prior to the supper meeting, the Technical Group held a session to hear a paper on "Methyl Pentadiene and Copolymers with Butadiene," delivered by Dr. F. M. MacMillan of the Shell Development Co. The talk was similar to that given by Dr. MacMillan before the Northern California Rubber Group recently, an abstract of which was published in our previous issue. Cliff Neville, of the U. S. Rubber Co., was in charge of the technical meeting.

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Karl Faulhaber, of Faulco Industries, 1346 East Slausson Avenue, who has been out of the rubber industry and into plywood manufacture since the war started, is planning to get back into rubber goods production in a few months. Mr. Faulhaber recently spent about a month in Salt Lake City and in the Pacific Northwest in the interests of his business.

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Work on the new Sierra Rubber plant in Los Angeles is progressing very nicely, but the date for full production has not been definitely set.

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Willard Voit and L. C. "Jack" Weimer of the W. J. Voit Rubber Company recently spent considerable time in the East, New York being the principal point visited. Mr. Weimer was due home about November 8 and Mr. Voit a little later.

---

The S and G Rubber Company is the name of a new rubber goods manufacturing concern recently established by John Galitza and Kalmon Simon at 1401-3 Mateo Street, Los Angeles. The plant occupies two buildings with about 10,000 square feet of floor space while a warehouse has been provided at 2450 Whittier Boulevard. Production got under way in a small way earlier in November but plans are made for a plant of considerable size later. Machinery will be installed as rapidly as is needed by the expanding business. Small mechanical rubber goods will be turned out.

Mr. Galitza was formerly chief chemist for the Sierra Rubber Company and Mr. Simon was formerly superintendent of the United Rubber Company. The location is good and the men have both had plenty of experience so they have reason to expect a good business as soon as they get going in good order.

---

W. J. Shira, who was with the B. F. Goodrich Company for thirty years (starting with Diamond) and who during the last three years has been with Farrel-Birmingham Company, Inc., representing that company in the Pacific Northwest, has joined Thermoid of California, Inc., as plant superintendent.

Carl Dunkel, who has been connected with different rubber plants in Los Angeles, as well as for a few years with the Beaurepaire set-up in Australia, has also joined Thermoid as assistant to Mr. Shira.

Mr. Shira was with Goodrich when the present Los Angeles plant was being built and he was a charter member of the Los Angeles Rubber Group. He states that his intention is to get back into the harness in the Group's activities as soon as possible. He says it seems like coming home.

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Work on the new plant of the Oliver Tire and Rubber Company of Oakland is progressing rapidly, the new plant taking the place of the one that was burned a month ago. Some of the machinery from the old plant has been salvaged and refinished but the set-up for the most part will be brand new. The new location is 65th Street and Vallejo in Emeryville, an Oakland suburb.

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Walter E. Boswell, of Thiokol Corporation, made a business trip to the Northwest during the past month.

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B. H. Barnes, of the Bettis Rubber Company, recently made a business trip through Texas and other points in that area.

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Wallace Maddox, of the Kirkhill Rubber Company (St. Andrews plant), has returned from an eastern business trip.

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A. W. Holmberg, of Dispersions Process, Inc., New York City, spent a few days in the Los Angeles area recently. The firm is locally represented by H. M. Royal, Inc.

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E. D. Caram, former proprietor of the Caram Manufacturing Company, who recently underwent an operation at the Cedars of Lebanon Hospital in Los Angeles, has recovered satisfactorily and at this writing is planning an extensive trip with his wife. He expects to go into business again in Los Angeles but in some other line than that in which he formerly was engaged.

**Bill Snyder**

*who recently succeeded Vic Vodra as Pacific representative of the R. T. Vanderbilt Co.*

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Details of the Los Angeles Rubber Group's Christmas party have been arranged for the evening of December 4. The group will go en masse to the Theatre Mart where the stage play, "The Drunkard," has been showing continuously for more than thirteen years. The boys have reserved 350 seats and will witness the 4550th performance of the play.

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A blind bogey turkey shoot was a feature of the pre-Thanksgiving golf tournament engineered by Al Pickard for the Los Angeles Rubber Group on Saturday, November 3. Three live turkeys and other prizes were provided.

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The new year book of the Los Angeles Rubber Group is nearing completion. Deke Maddy (Hycar Chemical) has been in active charge of the mass of detail. The plan is to get out a larger and better book each year. So far that record has been achieved and the boys say it will be achieved again.

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Crepe soles of synthetic rubber, sold under the trade name of "Chem-crepe," which will hold their shape better than soles of natural crepe, according to the manufacturer, have been introduced by Goodyear.

# MAGNESIA

## MAGNESIUM CARBONATE
## MAGNESIUM OXIDE

**EXTRA LIGHT** The Original Neoprene Type
A supreme quality product for the rubber trade. Extremely fine state of division. Improves storage stability and resistance to scorching. A curing agent unexcelled for increased modulus, greater resilience, reduced heat build-up, lower compression set and retention of tensile strength during heat service.

**LIGHT** A high quality product of greater density than "Extra Light," but high in MgO and low in impurities. An excellent value for many uses.

**MEDIUM** A good value. Very active. High Magnesia content, low in impurities. Medium density.

**HEAVY** All types can be furnished. Specially ground to meet the exacting Code Pigment Specifications of the Rubber Trade. Unground types for chemical uses.

**PACKAGES** Specially designed to protect contents from moisture and air. Corrugated carton with special water-proof liner, and inner paper liner. Five-ply multi-wall bag, including asphalt liner.

*Special Service for All Requirements of the Rubber Trade*

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*Specialist in Magnesia*

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DETROIT—C. L. Hueston
LOS ANGELES—The C. P. Hall Co. of California
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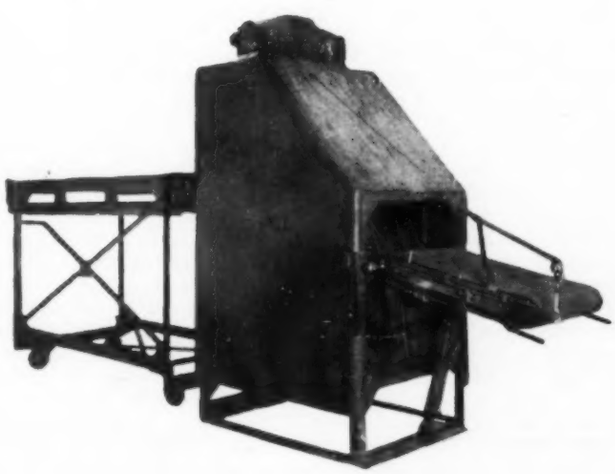
NEWARK, N. J.—Chas. S. Wood & Co., Inc.
PORTLAND, ORE.—Miller & Zehrung Chemical Co.
ST. PAUL, MINN.—George C. Brandt, Inc.
SEATTLE, WASH.—Carl F. Miller & Co.
TRENTON, N. J.—General Supply & Chemical Co.

# AUTOMATIC MILL BATCH-OFF MACHINE



***A Big Time and Labor Saver for the Rubber Industry***

**Why lose valuable mixing time slabbing off by hand when it can be done automatically?**

**At last you are able to reduce that Banbury cycle.**

**One more of your synthetic rubber problems solved.**

*Write Today for Full Particulars*

## The Akron Standard Mold Co.

Akron — "The Established Measure of Value" — Ohio

# CANADIAN NEWS

The average motorist will have to wait a long time, possibly another year, before he will be able to buy new tires, although there is no shortage of synthetic rubber, according to a survey of Canadian government and tire company officials.

These officials all agreed that there is plenty of synthetic rubber to satisfy all demands for tires. They emphasized, too, that tire companies are producing to capacity and some even are extending their production facilities. It was indicated, however, that the main factor preventing the average driver from replacing his threadbare tires is the ever increasing demand for them from essential motorists. "The demand now is miles ahead of production," one tire company official stated.

Other factors also have a hand in postponing the date when tire priorities will be lifted. Among these are export commitments, mainly to UNRRA, available manpower and labor-management disputes, and the fact that 1946 model cars will have to be provided with new tires. In addition, the armed forces still need new tires, although in greatly reduced quantities. It was pointed out that all these factors are variable. Export commitments vary from month to month. Labor disputes lowered production in some of the tire companies during the summer. One company was shut down during the month of August. Also, it is not yet certain at what rate the new cars will be produced.

Meanwhile essential drivers who generally have been driving newer model cars are finding that the tires that came with their 1941-42 cars now are wearing pretty thin. Thus for the first time new thousands are applying for the tires to which they are entitled. Furthermore, the Government added many more classes of car drivers to the "essential" list last June. Many of these drivers now are filling out their first application forms for tire priorities. In spite of cutbacks in the demand for tires by the armed forces, one tire company official said the demand by civilians still outstripped capacity production.

A look at figures released by the Government bears out this report. The Government recently announced that the 20,000 tire dealers throughout Canada now have only 250,000 tires in stock, an average of 12½ per dealer. During the 1938-1940 period, dealers stocked about 900,000 tires.

Another company official pointed out that more work is required to produce tires made from synthetic rubber—the only type now available for civilian use. Passenger cars get 95 per cent of pre-war service on modern synthetic tires, he said. Trucks which carry heavy loads at high speeds need heat-resistant tires containing a high percentage of natural rubber. This still is practically non-existent, said the company spokesman. Officials indicated that the rubber-rich Malay States and East Indies will not be a source of crude rubber for some months to come. Shipments of this rubber are not expected to reach Canada in any quantity before next spring, they said. Even then, almost all this crude rubber will be used solely for truck tires.

Rubber company officials said that Canada is aiming at a production of 240,000 tires a month during 1946. They said that it was reasonable to expect that 170,000 of these will be slated for export, essential users and the new car market. The remaining 70,000 tires will have to be shared among the estimated 400,000 non-essential drivers. First, however, inventories must be built up so stocks may be available to draw upon.

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A. R. Kaufman, president of the Kaufman Rubber Company, Ltd., of Kitchener, Ontario, is the prime mover in a gigantic plan announced by Colonel George Drew, Premier of the Province, under which a plant operated at Collingwood, Ontario, taken over by Mr. Kaufman, will produce 150,000 suites of furniture for Britain. The furniture units will be semi-manufactured in Canada and shipped to Britain in knocked-down form. For this purpose, the Kaufman Rubber Company has taken over the former Clyde Aircraft Manufacturing Company plant, Collingwood's second largest industry, and will employ at least 2,000 persons. Said Premier Drew, "When the complete story is known in the near future, the project running into millions of dollars in trade value to Ontario, not to mention the creation of new jobs, will be recorded amongst the most important Empire trade deals ever negotiated." Mass production is expected to begin within three months.

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The huge future demand for rubber of all kinds makes plenty of room for synthetic rubber in the post-war world, H. G. Miles, chairman of the Empire Rubber Co., and of Rubber Bonders, Ltd., of Dunstable, Bedfordshire, England, said in an interview in Montreal on October 26. Mr. Miles is on an extended tour of Canada and the United States, renewing business contacts and preparing for the arrival of rubber technicians from his companies who are coming here to study rubber developments. He believes there is every likelihood that these companies will be expanding throughout the Empire, possibly in Canada.

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The availability of crotonic acid, an alpha-beta unsaturated carboxylyic acid containing four atoms, has been announced by Shawinigan Chemicals, Ltd., Montreal. Preliminary experiments are reported to indicate that crotonic acid and its derivatives may be of use in copolymerization with vinyl compounds, butadiene, styrene, and similar monomers, as well as in the modification of alkyd resins, in the preparation of solventless varnishes, in the production of modified cellulose esters for use in coating regenerated cellulose films and fibres, and in the production of a number of miscellaneous solvents, plasticizers, insecticides and pharmaceuticals.

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Canadian Lastex, Limited, has just announced the appointment of A. G. McKinnon, general manager of Dominion Rubber Munitions, Ltd., wartime subsidiary of the Dominion Rubber Co., Ltd., as assistant general manager. Associated with U. S. Rubber from 1917 in various capacities, Mr. McKinnon joined Canadian Lastex in 1932 as sales manager, and ten years later was given leave of absence to take charge of the Dominion Rubber Munitions project at Cap de la Madeleine, Quebec.

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Mr. George W. Sawin, president of the B. F. Goodrich Rubber Co. of Canada, Ltd., held out little hope for the unrationing of civilian tires before the end of the year. He said production figures up to the present would hardly warrant the expectation of unrationing tires until early in 1946.

Truck tires will be released on an unrationed basis before passenger tires, Mr. Sawin thought. A cut in war orders has given right of way to truck tire production with the result that they will come on the market ahead of automobile tires. He was optimistic that the truck tire situation will be considerably improved by the end of the year with every possibility of an early release of controls after January 1.

Stoppages and slow-downs have definitely proved a setback to passenger tire production, according to Mr. Sawin. He would not speculate as to how long they have postponed lifting controls on their distribution. Hope entertained two months ago that they might be available for general use by the end of the year has vanished.

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The key of the town of Bowmanville, Ontario, was presented by Mayor K. Morris on November 2 to Charles Cattran, superintendent of the Bowmanville branch of the Goodyear Tire & Rubber Company on the occasion of the company's 35th anniversary in Canada. A dinner was held at which P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Company, Akron, Ohio, presented 35-year pins to 16 employees.

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Representatives of two rubber companies are included in the directorate of the Association of Canadian Advertisers which held its annual business meeting in Toronto recently. They are J. G. Hagey, of the B. F. Goodrich Rubber Co., Kitchener, Ontario, and H. E. Smyth, of Dominion Rubber Co., Montreal.

# CIRCOSOL - 2XH

# AN ELASTICATOR* FOR GR-S

## 2 Years' Successful Processing . . . Tons of Highly Resilient Stock . . . Prove the Exceptional Value of CIRCOSOL-2XH

In January, 1944, after two years' intensive research and experiment, the Sun Oil Company introduced CIRCOSOL-2XH, a new "Elasticator" for compounding GR-S.

CIRCOSOL-2XH, in contrast with many softeners or plasticizers, was especially developed to improve and preserve the inherent qualities present in GR-S.

Now, after nearly two years of performance-proof (daily production in plants of leading tire-makers), engineers report that CIRCOSOL-2XH provides:

1. Highly resilient stocks with minimum heat-build-up characteristics.
2. High-modulus stocks with minimum loading (contributing strength to the tire-structure where needed most).
3. A desirable state of cure without need for sulphur allowances; in curing, it is neutral in respect to GR-S.
4. Stocks highly resistant to flex-cracking.

Briefly, these two years have proved that CIRCOSOL-2XH simplifies commercial processing of GR-S. For full information on this new and important elasticator, write for free booklet.

**SUN OIL COMPANY • *Philadelphia 3, Pa.***

***Sponsors of the Sunoco News-Voice of the Air—Lowell Thomas***

** The word "ELASTICATOR" denotes the property of a processing-aid which is capable of developing an unusual degree of resilience in GR-S Vulcanizates.*

**SUNOCO** **SUN INDUSTRIAL PRODUCTS**

*OILS FOR AMERICAN INDUSTRY*

# OBITUARIES

### *Victor I. Montenyohl*

Victor I. Montenyohl, a former vice-president, treasurer and director of the B. F. Goodrich Co., died of coronary thrombosis at his home in Mexico City on October 27, at the age of 55. Born in Akron, Mr. Montenyohl joined Goodrich in 1907 as a stenographer and worked his way up through successive positions in the treasury department. Except for two years spent in the company's New York offices, his entire business career was confined to Akron.

In 1920 Mr. Montenyohl was made assistant treasurer, in 1927 and 1928 treasurer and a director, respectively, and in 1940 he became a vice-president. He also served as president of the International B. F. Goodrich Corp. and as head of the Philadelphia Rubber Works Co., Akron, a Goodrich subsidiary. In recent years he was responsible for the development of Koroseal and was in charge of Goodrich chemical sales and traffic divisions, while during the war he served as the company's representative in formulating the government synthetic rubber program. In 1942 he retired, owing to ill health, and transferred his residence to Mexico City.

Mr. Montenyohl is survived by a widow, a son, and a daughter. Funeral services were held in Mexico City, and the body was cremated.

### *George W. Gay, Jr.*

George Willard Gay, Jr., treasurer and a director of the American Felt Co., Glenville, Conn., died in White Plains Hospital, White Plains, N. Y., on November 11. He was 61 years of age. Mr. Gay was a graduate of Tufts College. He is survived by a widow and three daughters. The family home is at 17 Harcourt Rd., Scarsdale, N. Y.

### *D. K. Pope*

D. K. Pope, general sales manager of the St. Marys Manufacturing Co., St. Marys, Ohio, subsidiary of the Goodyear Tire & Rubber Co., died suddenly of a heart attack at his home in Wapakoneta, Ohio, on October 6. He was 40 years of age. Mr. Pope is survived by a widow and two sons. Burial was in Greenlawn Cemetery, Wapakoneta.

### *Wilfred C. Minor*

Wilfred C. Minor, head of the Alling Rubber Co., well known jobbing concern of Troy, N. Y., died in Albany Hospital, Albany, N. Y., on October 31. He was 68 years of age. Mr. Minor was a past president of the Aurania Club and a member of the Rotary Club.

### *Pierre A. Cady*

Pierre A. Cady, laboratory manager of the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., died in Presbyterian Hospital, New York City, on October 30, after a long illness. He was 54 years of age. Before joining the Passaic company 29 years ago, Mr. Cady had been associated with the Combination Rubber Co., Bloomfield, N. J., and the Hodgman Rubber Co., Tuckahoe, N. Y. At Manhattan Rubber he had charge of several production departments and was instrumental in developing several important products. Mr. Cady is survived by a widow, two sons, and a daughter. The family home is at 96 Park Ave., Passaic, N. J.

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### Introduce Neoprene Type S

Neoprene Type S, a new elastomer which is said to be well suited to the manufacture of crepe soles, has been introduced by the Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Advantages claimed for the new elastomer are that it is uniformly tough, resists softening by milling, resists sunlight and heat-deterioration better than natural rubber, can be extruded with cheap fillers, and can be colored to any desired shade. It is also believed that Neoprene Type S will resist spreading on the shoe to a much greater degree than natural rubber.

### New Scrap Rubber Specifications

Revised specifications for scrap rubber, as of September 21, 1945, have been issued by the Rubber Reclaimers Association, Inc. The main difference between the new specifications and those issued on June 1, 1944 (see RUBBER AGE, June, 1944, pp. 269-270), is the inclusion of synthetic rubber grades of scrap. Copies of the specifications may be obtained by writing to C. T. Jansen, secretary of the Association, at 10 East 40th St., New York 16, N. Y.

### Kerite Stock on Market

Fifty thousand shares of common stock of the Kerite Co., formerly the Kerite Insulated Wire & Cable Co., which maintains sales headquarters in New York City, and a factory at Seymour, Conn., were put on the market last month. The stock, sold for the account of certain stockholders, was offered at $21.00 a share by a group of underwriters headed by the Lee Higginson Corporation. The stock has a par value of $10.00.

### Installs Electronic Vulcanizer

The Firestone Tire & Rubber Co. has announced that it has installed the first commercial electronic vulcanizer in the rubber industry for use in the manufacture of Foamex mattresses at its Fall River, Mass., plant. The mass production unit, a three-story device utilizing 125 kw. of electronic energy to service two complete vulcanization chambers, was designed by Firestone engineers in cooperation with the Westinghouse Electric Corp., Baltimore, Md. In preliminary tests, large double-bed mattresses that previously required a 35-minute cure by the old steam jacket method were completely cured in 5 minutes. Close examination revealed that the final product was far superior structurally to the old type, owing largely to instantaneous heat supplied uniformly to all parts of the mattress. Firestone is also using electronic curing in the manufacture of other rubber products, such as large hard rubber wheels and brake blocks.

### New Tire Building Machine

The development and use of a new automatic tire building machine that produces small-size passenger car tires at the rate of one every two minutes was revealed by the General Tire & Rubber Co. this month. The machine, which is being produced by the Ferry Machine Co., Kent, Ohio, was invented by Walter Breth of General Tire's development department. Five of the machines are already in operation at the company's Akron plant, and more installations are planned for the early future. (EDITOR'S NOTE: A two-page pictorial description of the new machine appears elsewhere in this issue.)

### Painter Joins Norwalk

R. P. Painter, who has been with the Navy Department since 1942 in the capacity of supervisor of the Rubber Laboratory of the Naval Air Experimental Station, U. S. Navy Yard, Philadelphia, Penna., has joined the Norwalk Tire & Rubber Co., Norwalk, Conn., as head of its chemical laboratory. Before going to Philadelphia, Mr. Painter was connected with the Mansfield Tire & Rubber Co., Mansfield, Ohio, where he was employed as assistant to the chief chemist from 1935 to 1942. He is a graduate of Ashland College.

### Wooster Opens New Plant

The Wooster Rubber Co., Wooster, Ohio, has taken a lease on the plant formerly occupied by the Steel Storage File Co., of the same city, and has converted the building for the manufacture of rubber-covered wire goods for household use, including dish drainer baskets and rubber-covered baskets for electric washing machine and kitchen sink manufacturers. New equipment has been purchased, and as soon as it has been installed the factory, which is known as Wooster Rubber Plant Number 2, will employ 100 additional workers.

The C. P. Hall Co.
CHEMICAL MANUFACTURERS

ACCELERATORS

PLASTICIZERS

ANTIOXIDANTS

*A Complete Line of Approved Compounding Materials*

AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL.

# CAPITOL LINER PROCESS

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**For Production**

**Efficiency and**

**Economy use**

**CAPITOL PROCESS**

**for your Rubber**

**Repellent Liners.**

***Send us 50 or 100 yards of liner material. We will treat it without charge and return for testing in your plant.***

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**TEXTILE PROOFERS, INC.**

181-193 Culver Ave., Jersey City 5, N. J.

*Originators of the Capitol Liner Process*


## Report on German Synthetic Tires

*(Continued from page 215)*

Certain of the plants were damaged by bombing. It was estimated that there was at present sufficient undamaged capacity to produce 900,000 to 1,000,000 tires per month in Germany proper (excluding Semperit).

### Labor Supply

Statistics as to the labor situation in Germany were not supplied, but it was stated that generally there was more productive capacity available than there was labor to operate it. In most of the heavy industries the employment of women was 50% or greater.

In the case of the rubber industry, there were two good examples of the excess of productive capacity over labor supply. One was shown by the table of tire production given above. It showed that the actual production of bicycle tires for the third quarter of 1943 was 888,100 per month whereas had labor been available to operate the entire productive capacity 1,560,000 would have been made. In the manufacture of motorcycle and automobile tires, the same situation existed. In September, 1943, it was estimated that the production of tires could be nearly doubled if the proper supply of labor was made available. Statements were made that this situation was common in most industries except those having the highest priority.

### General

(1) Germany had one central adjustment agency for all rubber products. Its headquarters was at Wattershausen. In general, its operation was under the control of the cartels, but its policy was guided to a certain extent by the Fachgruppe.

(2) The opinion was that German manufacturers felt that German reclaim was inferior to that produced in the United States.

(3) General information was obtained concerning the manufacture of synthetic rubber in Italy. There was one plant in the Po valley which produced 600 tons of Buna S per month. There was another plant of the same approximate size under construction near Rome. It was never completed.

**FOR RESISTANCE TO CUT AND CRACK GROWTH USE PHILBLACK A**

(FOR FURTHER DETAILS, SEE AD ON PAGE 142)

# HEVEATEX

**Agents of Rubber Reserve Company for Natural Latex. Distributors of GR-S Latex**

**Rubber Latex Compounds**
**Synthetic Rubber Latex Compounds**
**Synthetic Resin Compounds and Adhesives**
**Synthetic Latex Adhesives**
**Aqueous Dispersions of Reclaimed Rubber**

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***Write us for further information***

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## HEVEATEX CORPORATION

78 GOODYEAR AVE., MELROSE, MASS.

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Trade Mark

*Announcing a forthcoming series of illustrated*

SCOTT TESTERS MAINTENANCE DATA SHEETS

to be published in our advertisements in this magazine. These Data Sheets will prove of great practical value to owners of Scott Testers.

SCOTT TESTERS, INC.
Providence, Rhode Island

**SCOTT TESTERS MAINTENANCE HAND BOOK**

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Alignment
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Lubrication
Belt
**Recorder**
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## —RUBBER SUBSTITUTES—

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Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods—be they Synthetic, Natural, or Reclaimed.

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*A LONG ESTABLISHED AND PROVEN PRODUCT*

THE CARTER BELL MFG. CO.
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CARTER BELL PRODUCTS
1903
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# NEW EQUIPMENT

## Precision Vari-Temp Cold Cabinet

A vari-temp cold cabinet, operating with dry ice, offered by the Precision Scientific Co., 1750 N. Springfield Ave., Chicago 47, Ill., is designed to satisfy all the cold test conditions encountered and required by present-day testing techniques. A vertieal front door provides easy access to a chamber sufficiently large to hold

the various pieces of apparatus used in making the Youngs Modulus test of natural and synthetic rubbers at normal and sub-normal temperatures, according to ASTM D-797. Thermometers, instruments and specimens under test are readily visible at all times, owing to the use of a 7-pane sealed window unit which prevents condensation and frosting and a fluorescent light which is shielded to prevent both direct and indirect glare.

The incorporation of a heating unit in the cold chamber allows a full temperature-testing range of from —90° to + 22°F. Thermal losses are kept at a minimum by completely insulating the inner walls from the outer wall. Constant temperature in the specimen chamber is insured by an air stirrer which holds the temperature constant to ±1° F. This fan is automatically turned off when the door is opened, to prevent a rapid temperature change, and a blower circulates the air to and from the chamber. Insulating tubes prevent dissipation of cold from the inner chamber. Mechanical convection provides uniform temperature, and all temperatures are controlled thermostatically, one thermostat being provided for low temperatures, and one for high temperatures.

The specimen chamber is substantially supported by a solid steel support. A hole, 1 inch in diameter, is provided in the center of both sides, the top, and the rear of the specimen chamber. Metal plates 4 inches wide and the same height as the chamber are centered on each side, in the rear, and on the top to provide facilities for mounting the test apparatus from any of these positions. Holes can be drilled and tapped at

**As a MOLD LUBRICANT**

—Orvus permits articles to leave molds readily; molds clean easily.
—Orvus is effective in hardest water.
—Orvus forms no insoluble materials which might be deposited as a film on mold or rubber.

**For WASHING and FINISHING**

—Orvus cleans thoroughly such articles as inner tubes, automotive parts and other molded and extruded rubber goods. Leaves articles with a pleasing finish.

Write for further details about Orvus.

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**ORVUS** is a sulfated alcohol type cleanser—not a soap.

SIMPLEX
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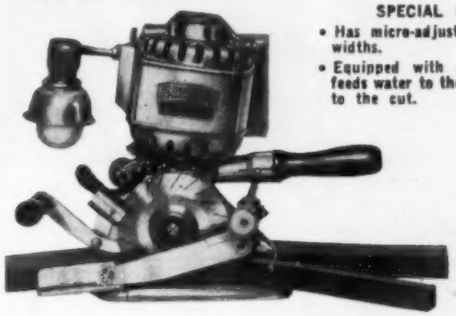
# RUBBER STRIP CUTTER

PATENTED

**A PORTABLE machine capable of stripping slab rubber up to 1" thick at the rate of 20,000 feet in 8 hours. Any width desired.**



SPECIAL FEATURES

- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion-induction motor which carries any overloads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

*Now in use by many leading Rubber Manufacturers & Jobbers*

**Simplex Cloth Cutting Machine Co., Inc.**

*Manufacturers of a Complete Line of Cloth Cutting Machinery*
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## CRYSTEX insoluble SULPHUR

**Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure**
**Refined Rubbermakers' Sulphur, Tube Brand, 100% Pure**
**Carbon Tetrachloride, Carbon Bisulphide**
**Caustic Soda, Sulphur Chloride**

| | | | |
|---|---|---|---|
| *Aluminum Sulphate | *Copperas | Silicon Tetrachloride | *Superphosphate |
| Borax | Cream of Tartar | Sodium Hydrosulphide | Tartar Emetic |
| Boric Acid | Chlorine | Stripper, Textile | Tartaric Acid |
| Citric Acid | Muriatic Acid | Sulphur | Titanium Tetrachloride |
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## STAUFFER CHEMICAL CO.

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*Again Available*

FRANKLIN'S
F77
RUBBER DRESSING
AND PRESERVER

PREVENTS OXIDATION

IMPROVES APPEARANCE

INCREASES SALABILITY

**Manufacturers of rubber goods will welcome the return of this important Franklin product, finer today because of extensive wartime use and experience. FRANKLIN'S F77 imparts a rich lustrous finish that improves appearance, increases durability. Contains no volatile solvents. Is odorless, non-toxic, non-inflammable. Can be sponged, sprayed or dipped.**

*Write for complete information.*

FRANKLIN RESEARCH CO.
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these points in order to fasten the apparatus securely to the cabinet. Heavy gauge tinned copper has been used in all parts liable to corrosion due to condensation. To facilitate cleaning and provide for the disposal of condensation on the inside of the chamber, drains are provided for both the dry ice chamber and the test chamber.

The cabinet is available in two sizes, one of 1 cubic foot capacity and one of 8 cubic feet capacity. The former is 53 inches in height, 28 inches in width, and 26 inches in depth, while the latter is 73 x 39 x 39 inches. The center of the test chamber, which is 24 x 24 x 24 inches, is located at a convenient operating height of 48 inches, and when the door is open the entire test chamber is accessible.

## Electronic Feed Regulator

A new electronic feed regulator manufactured by Mosher Electronic Controls, 130 W. 42nd St., New York 18, N. Y., is said to do away with the guesswork of human controls in feeding cutters, attrition mills, and hammer mills. Whereas previously it was necessary for the operator to watch feeding and to manually regulate the feed to avoid overloads and mill choke-up, the electronic regulator maintains the load on pulverizing equipment at the maximum rated capacity of the connected motor. Momentary overloads are prevented from actuating or disturbing the feed control relay, and an underload light signal indicates failure of material to reach the pulverizer owing to empty bins or arching at some point in the flow above the feeder. Additional light or sound signals can be wired to any required location. Through the use of this regulator, increases in production by as much as 50% have been reported.

An entirely new type of **industrial truck**, which makes possible the complete conversion of the truck from one type of load-carrier to suit other requirements simply by the addition of standard available accessories, has been developed by the Materials Handling Division of the Market Forge Co., Everett, Mass.

**FOR EASY PROCESSING, USE PHILBLACK A**


(FOR FURTHER DETAILS, SEE AD ON PAGE 142 )

• *NEW* •

**RUBBER-FLO**
**MOLD LUBRICANT**

This is what it does:
—Gives lustre to finished parts;
—Easier removal of parts;
—Keeps molds cleaner longer;
—Economical.

**RUBBER-SOL**

A new easy and faster method for salvaging metal parts from rubber. Ideal for both aluminum and steel molds. Send us a sample of your salvaged parts for inspection. RUBBER-SOL has many other uses too!

*Send Us Your Problems*

**PREVENTIVE MAINTENANCE CO.**
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**CONTINENTAL MACHINERY CO.**
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*Designers and Manufacturers of*

**RUBBER PLANT EQUIPMENT**

- All types of Rubber Machinery and Plant Equipment for every requirement of Large and Small Factories.
- Complete Plant Design and Layout; also Special Machinery Developed and Manufactured.
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We also manufacture Mold Lubricants for use with synthetic as well as natural rubber.

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★ *IMPROVE YOUR PRODUCTS by having us treat your fabrics to render them . . .*

**MILDEW-PROOF • FLAME-PROOF**
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OUR ENGINEERS WILL GLADLY CALL AT YOUR CONVENIENCE

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Distributors for RUBBER RESERVE CO. of

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COMPOUNDS FROM
SYNTHETIC LATICES

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for
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60% LATEX
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*We maintain a fully equipped laboratory and free consulting service*

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"G" RESIN—"R" RESINS
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COUMARONE AND MODIFIED COUMARONE RESINS

NEUTRAL
WATER-PROOF
CHEMICALLY RESISTANT

The most complete line of coumarone and modified coumarone resins manufactured. Available in colors ranging from very pale amber to dark brown and in melting points from 5° to 160° C.

They are used in the production of adhesives, chewing gum, concrete curing compounds, electrical insulation, floor tile, inks, lacquers, linoleum, paints, paper coatings, pipe coatings, transparent stripping compounds, textile coatings, wood penetrants and in the compounding of natural and synthetic rubber.

*Write to us for information on the use of Neville Resins in your products.*

A-19

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Chemicals for the Nation's Vital Industries

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RECLAIMING, PLASTICIZING, NEUTRAL, CREOSOTE, AND SHINGLE STAIN OILS



## Taber Power-Driven Stiffness Gauge

A new power-driven stiffness gauge, for determining standard measurements of the stiffness and resilient qualities of flexible materials up to ⅛ inches in thickness, such as laminated plastic, cardboard, light metallic sheet and wire, has been introduced by the Taber Instrument Corp., North Tonawanda, N. Y. The new instrument, without the addition of attachments, will measure both initial and normal stiffness characteristics, while elastic drift or "creep" of the specimen structure can be charted from the various readings.

The calibrated weighing system is of the pendulum type. The entire pendulum assembly, with the exception of the calibration weight, is made of strong aluminum alloy, to keep inertia and bearing friction to a minimum, and the face of the specimen clamp is mounted exactly on the center of rotation, to insure constant test length of the specimen and to achieve accurate and comparable test data.

A set of three calibrated weights is furnished with the instrument, these weights being calibrated to 500, 1000 and 2000 stiffness units. Weights calibrated to 3000 and 5000 stiffness units are also available. For measuring the flexural strength of very thin and flexible materials below 10 units stiffness, an attachment is provided to eliminate mechanical friction and inertia.

The instrument is portable, weighing only 15 pounds, and it can be plugged into any 115 volt, 60 cycle circuit. Its simplicity of operation and quick, direct readings are said to make it easy to use even by those without previous technical experience.

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OVEN-MATERIALS-HANDLING SYSTEMS
OVEN PROCESSING SYSTEMS FOR ALL MATERIALS
THE INDUSTRIAL Oven Engineering COMPANY
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*LAURIC ACID*
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*CAPRIC ACID*

*all 90 per cent or better in purity*

As the nation's oldest and largest suppliers of coconut oil in tank car and drum lots we are happy to announce to the trade our entrance into the coconut oil fatty acid field.

*To our friends able to obtain government approval we can furnish limited quantities of the above products.*

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**LOAD-CARRIERS**

SEND FOR LOAD-CARRIER MANUAL No. 1003MH

Standardized Load - Carriers, equipped with deep stake pockets at each corner make possible the complete conversion of the truck by the addition of standard accessories. Custom built trucks are also available in stainless steel, aluminum and Monel Metal.

## MARKET FORGE COMPANY

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# All Ready to Travel ... with WRINKLE

**There's no reason why canvas-covered luggage, for example, cannot be given a distinctive appearance with WRINKLE, for this one-coat finish has already been used successfully to coat a variety of fabrics.**

**Manufacturers who would like to give their coated fabrics increased eye-appeal through pleasing patterns can now do so with WRINKLE — without investing in expensive embossing rolls.**

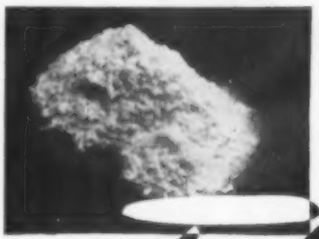
**If you manufacture such materials, WRINKLE offers you an attractive, durable, low-cost finish which is worth investigating. Why not send us samples of your fabrics for coating . . . today?**

## NEW WRINKLE INC.

**1775 Springfield St., Dayton 3, Ohio**

"Wrinkle," "Billy Wrinkle" and "New Wrinkle" are registered trademarks of New Wrinkle, Inc.

For NON-MARKING Sole Compounds...



RAYCO flock

Besides contributing non-marking qualities to sole compounds, Rayco Flock improves tensile strength, and tear resistance when used with synthetic, crude and reclaim stocks.

*Request samples and prices*

**RAYON PROCESSING CO.** of R.I. INC.

100 TREMONT ST., CENTRAL FALLS, RHODE ISLAND

*Developers and Producers of Cotton Fillers for Plastics*



**RANDALL & STICKNEY**

**Hand Grip Rubber Gauge No. 3-B**

| | | |
|---|---|---|
| Height .....9" | Length .....9¾" | Range .....½" |
| Depth of Throat ....6½" | Dial 50 Divisions Each Div. 1/1000" | Weight .... 4 lbs Frame . Aluminum |

Designed for gauging stock as it is coming from the calender.

**FRANK E. RANDALL, Waltham, Mass.**


# REVIEWS

## BOOKS

**New Crops for the New World.** Edited by Charles Morrow Wilson. Published by the Macmillan Co., 60 Fifth Ave., New York, N. Y. 6 x 9¼ in. 296 pp. $3.50.

Consisting of 16 chapters, contributed by 14 career scientists who are now doing significant work in many phases of inter-American and international agriculture, this book deals with important world crops and the role played by Latin American countries in the production of such crops. It tells the story of the rubber plantations flourishing in the South American forests, of the essential oils in Brazil and Honduras, of silk, of bamboos, of tropical fruits, of the breeding of livestock, and covers many more essential crops being grown more abundantly in Latin America today then ever before.

The chapter on rubber, entitled "Rubber Returns to Latin America," was prepared by Walter N. Bangham, director of the plant research department of the Goodyear Rubber Plantations Co. It traces the history of the rubber industry in Latin America, the rise and fall of prices, efforts to increase yields per tree and per acre, the fight against leaf blight, the assistance received from the U. S. Department of Agriculture and plantation operators in the Far East, the economics of rubber planting in South America, and makes a strong plea for small farms which Mr. Bangham holds is the key to large scale rubber production.

## BOOKLETS, CATALOGS, Etc.

**The Plastics Industry.** Plastics Materials Manufacturers' Association, 14th & K Sts., N.W., Washington 5, D. C. 5 x 7¼ in. 20 pp.

The purpose of this booklet is two-fold: to provide information which will be helpful in guiding those interested in the plastics business, and to correct certain widely-held misconceptions about the possibilities of the industry. Subjects taken up include the following: what plastics are, what the plastics industry is, major divisions of the industry, adhesive producers, specialty resins, replacement of metals by plastics, employment in the plastics industry, training for the plastics industry, increase in plastics materials during the war years, the role of the machinery manufacturer, and the post-war plastics industry. In connection with the subject of employment, there is a convenient listing of a few typical occupations in several main divisions of the industry, giving the title of the job and a brief description of the duties and approximate training required.

•

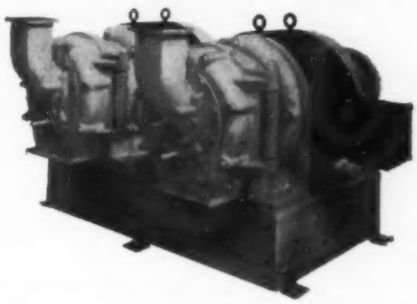
**Chemical Engineering Catalog: 1945-46.** Published by the Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y. 8½ x 11 in. 1708 pp.

This is the thirtieth annual edition of "The Process Industries' Catalog," and once again it furnishes complete, revised, up-to-date information on equipment, supplies and raw materials for the chemical process industries. Following the style of the last several issues, it is divided into four major sections, i.e., Trade Name Index, Equipment and Supplies, Chemicals and Materials, and Technical and Scientific Books. Classified indexes to the sections on equipment and chemicals are included in the respective sections, with manufacturers' catalogs representing the bulk of each section.

# ROBINSON

UNIQUE **Material Processing Equipment**

"Frigidisc" Grinders



Crushers, Grinders, Sifters, Attrition Mills . . . Material Processing Machinery of every type. Designed to your requirements by experienced engineers whose reputation is founded upon doing things right. Inquiries invited!

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**A HIGH QUALITY CONCENTRATED LIQUID MOLD AND MANDREL LUBRICANT— *NON-TOXIC, NON-TACKY, ODORLESS.***

- *Simplifies the removal of cured rubber from the molds.*
- *Results in a transparent satin-like finish.*
- *Does not build up on the molds.*
- *Extremely concentrated and low in cost.*

*A Direct Source for Zinc and other Metallic Stearates.*

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PURITY-UNIFORMITY-DEPENDABILITY

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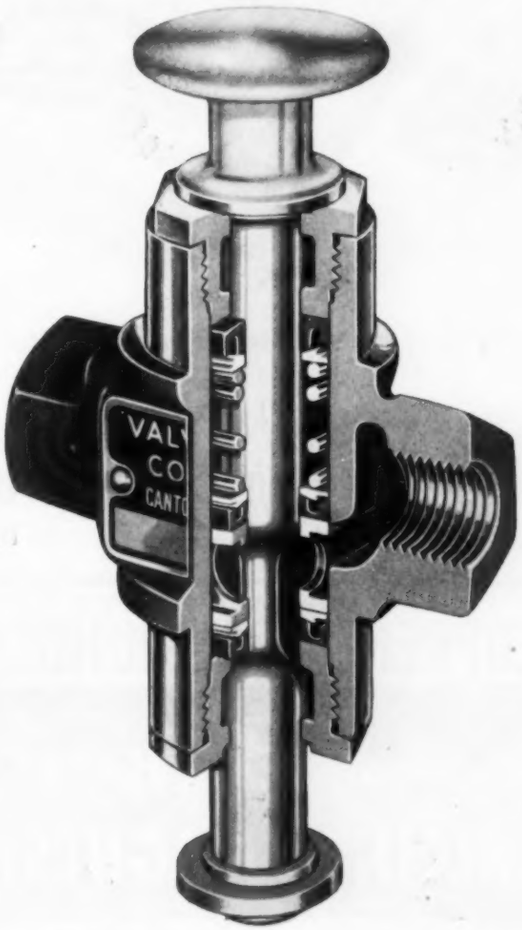
## AIR CONTROL VALVES



**KNOB OPERATED VALVE SHOWN**

Valvair valves are new in design and principle, standard valves have been operated more than two million times without leak with air pressure exceeding 100 lbs. They are designed for indefinite life and exceptionally hard service.

They are compact—they do not have metal seals—the body is made of cast bronze and steel parts are made of stainless steel—they will not corrode.

They are made in five sizes—¼, ⅜, ½, ¾ and 1 inch—and in two-way, three-way and four-way types. They can be furnished in eight or more different designs—knob, lever, foot, cam, clevis, single diaphragm, double diaphragm or solenoid operated.

They will control air efficiently up to 200 lbs. pressure with a very light movement. The area through the valves is equivalent to pipe size with minimum pressure drop. Write for literature.

**THE SINCLAIR-COLLINS VALVE COMPANY**
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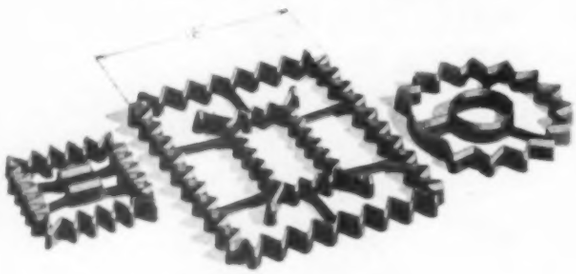
SHARP EDGE CUTTING DIES

Also PERFORATING TUBES and COLLETS of All Types



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Take Your Cutting Die Problems

To

INDEPENDENT DIE & SUPPLY CO.

LaSalle & Ohio Sts., St. Louis 4, Mo.

NEOPRENE COMPOUNDERS!

investigate Baker's CALCINED MAGNESIA

Baker supplies what neoprene compounders demand—Calcined Magnesia that is always uniform.

Test it in wetting power—in ease of dispersion—stability of compounded stock—rate of cure—tensile strength and plasticity.

Learn why Baker's Light Calcined Magnesia is better.

Send for free samples

J. T. BAKER CHEMICAL CO.

Phillipsburg, New Jersey

## REVIEWS (CONT'D)

**A Car Traveling People.** Automobile Manufacturers Association, New Center Building, Detroit, Mich. 8½ x 11 in. 48 pp.

This illustrated booklet sets forth the story of how completely the automobile has changed the habits and raised the living standard of Americans in the past 25 years and shows the automobile industry's key position in the national economy. It traces the changed trends in the growth of cities in recent years as a result of almost universal ownership of passenger cars and points to the highway and building construction that must be done immediately to meet the needs that will exist when 40,000,000 cars are on the road a few years hence. It also discusses the changes in rural living conditions, the creation of a tourist industry doing a $5 billion annual business, and a car selling and servicing industry with a yearly volume of $8.5 billion as national gains traceable directly to automotive travel.

•

**Cellulose Acetate.** Hercules Powder Co., Wilmington, Del. 8½ x 11 in. 36 pp.

This is a revised edition of the company's technical reference booklet on cellulose acetate. Included is a new section on the use of cellulose acetate in thermoplastic laminates and a discussion of the improved dimensional stability and greater water resistance of plastics made from high acetyl acetate. The text is divided into two parts. Part I describes the manufacture of acetate and sets forth its general and specific properties, while Part II is devoted to a discussion of its uses in solutions, laminates, and plastics. This material is illustrated with a great variety of tables, charts, and graphs. In addition to the information on plastics, the booklet suggests many other uses of the company's cellulose acetate in rayon, film and foil, and in specialty lacquers.

•

**A Guide for Retail Advertising and Selling.** (3rd Edition). Published by the National Association of Better Business Bureaus, Inc., Frederick Bldg., Cleveland 15, Ohio. 8½ x 11 in. $1.00.

Completely revised, this latest edition comprises a guide and reference to fair practice standards and definitions for retail advertising and selling, with dictionary index of trade terms, standards, descriptions, etc. Numerous references to Federal Trade Commission and other government rulings are included, all of them being condensed and clarified instead of being reproduced in the exact official wording. The guide is divided into two parts, the first being devoted to general rules, and the second to merchandise groups, including tires.

•

**A Good Name in Industry.** Falk Corp., 3001 W. Canal St., Milwaukee 8, Wis. 8½ x 11 in. 44 pp.

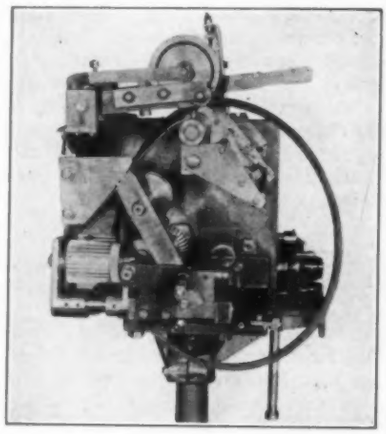
Commemorating the company's more than half-century of activity, this booklet gives a brief history of the firm and lists the products manufactured and the industries served. It also contains an account of the Milwaukee Plan of Apprentice Training, which was originated by the company, a discussion of employee relations, and a brief description of the organization's research activities. Numerous photographs of products and equipment illustrate the text.

•

**The A-B-C of Power Factor.** Electric Machinery Mfg. Co., Minneapolis 13, Minn. 8½ x 11 in. 20 pp.

This illustrated three-color booklet has been issued for executives, engineers and operators to help them gain greater economy and effectiveness of electric power through use of the synchronous motors manufactured by the company. After defining the term "power factor," the booklet takes up the subjects of how power factor is related to various A-C loads, how to get high power factor, how to make power factor calculations, etc.

## Utility Crimper Type Flipper
**for**
## Truck and Large Balloon Tires



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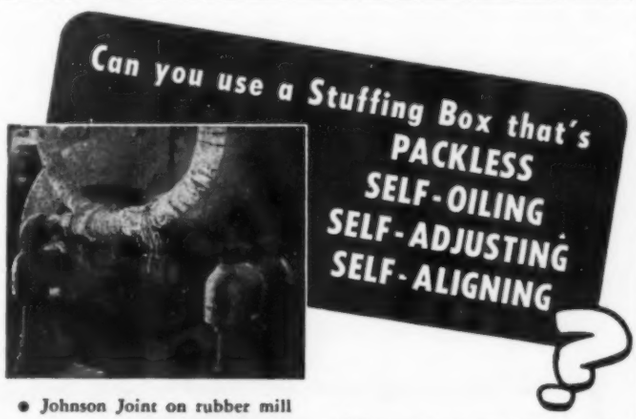
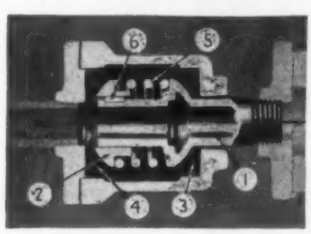
**Cudahy, Wisconsin**

Cable Address: UTILITY-MILWAUKEE
Long Distance Phone Call
MILWAUKEE—SHERIDAN 7020






• Johnson Joint on rubber mill



• Nipple (1), fastened to roll or drum. Sliding collar (2), keyed (6) to nipple. Carbon graphite seal ring (3) and bearing ring (4) eliminate oiling and packing. Spring (5) is for initial seating only; joint is pressure sealed.

IF you have a problem that has to do with getting steam, or liquids under pressure, into rotating machine parts, don't overlook the possibilities of the Johnson Rotary Pressure Joint.

It is being used on Paper Making and Textile machinery, in cold strip steel mills, on machine tools, and for an increasingly wide range of other applications. So completely does it outmode the old style stuffing box that industry has already adopted over 50,000 Johnson Joints in the few years since their development.

**Write for complete information**

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WITHOUT AFFECTING THE PHYSICAL PROPERTIES OF METAL INSERTS
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SUBMIT TRIAL SAMPLES

## REVIEWS (CONT'D)

**Aqueous Colloidal Black Dispersions.** (Bulletin No. 118-A). Binney & Smith Co., 41 East 42nd St., New York 17, N. Y. 8½ x 11 in. 6 pp.

This bulletin, which replaces one under a similar title issued a few years ago, brings up-to-date the data on the company's aqueous colloidal black dispersions. Data on four new products—Dispersion No. 2, No. 3 and T, and Coloidex No. 3—is given. Like the previous bulletin, information is furnished on the general characteristics of colloidal black dispersions, properties of the individual grades, and applications. A chart listing the various grades and giving their specific properties is also included.

•

**Synthetic Organic Chemicals.** Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York 17, N. Y. 8½ x 11 in. 120 pp.

The 12th edition of this catalog presents in condensed form up-to-date information on the properties, uses, and specifications of more than 160 products sold by the Carbide organization. It gives data on 34 products not included in previous editions and contains new chapters on acetals, sulfur compounds, polyethylene glycols, hydroxyethyl cellulose, and plasticizers. It also contains revised tables giving shipping information and specifications of particular value to purchasing agents.

•

**Firestone Research.** Firestone Tire & Rubber Co., Akron, Ohio. 10¾ x 8½ in. 40 pp.

Issued in commemoration of the dedication of the company's new $2,000,000 research laboratory in Akron, this booklet contains floor plans of the laboratory and pictorial descriptions of the various pieces of apparatus. It also includes some data on the company's history, product development, and planned research for the future. Some of the numerous products made by the company for the war effort are also pictured and briefly described.

•

**Cellular Rubber.** Sponge Rubber Products Co., Shelton, Conn. 8½ x 11 in. 4 pp.

This pamphlet describes various forms in which sponge rubber, bonded fibre and other sub-density materials are manufactured. It also contains illustrations of 98 molded, die-cut and fabricated shapes of flexible, elastic compressible products used for cushioning, shock absorption, vibration dampening, sealing, insulating, gasketing, etc., which are manufactured by the company.

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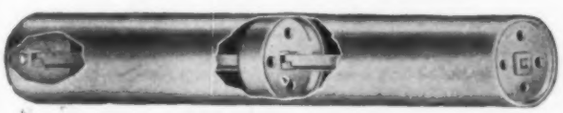

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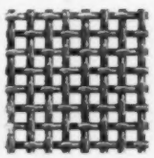
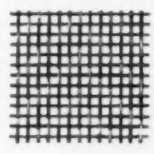
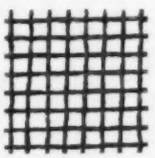
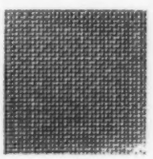




We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.



We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



| "Perfect" alloys and metals | "Perfect" Wire Cloth weaves | "Perfect" Wire Cloth processing | "Perfect" Wire Cloth products |
|---|---|---|---|
| Super-Loy | Arch-Crimp | Bending | Baskets |
| Steel | Coiled | Binding | Circles |
| Galvanized | Double-Crimp | Brazing | Cones |
| Tinned | Double-Fill | Calendering | Crates |
| Stainless Steel | Dutch | Clinching | Cylinders |
| Nickel-Chromium alloys | Filter | Cutting | Discs |
| Aluminum | Flat-Top | Dipping | Forms |
| Brass | Herringbone-Twill | Dishing | Leaves |
| Bronze | Intermediate-Crimp | Flanging | Lengths |
| Commercial | Rek-Tang | Flattening | Panels |
| Phosphor | Selvage-Edge | Forming | Pieces |
| Copper | Straight-Warp | Framing | Racks |
| Monel Metal | Stranded | Galvanizing | Ribbons |
| Nickel | Sta-Tru | Painting | Rolls |
| Any special alloys available in rod or wire form | Triple-Warp | Shearing | Sections |
| | Twilled | Slitting | Segments |
| | Twisted-Fill | Trimming | Spacers |
| | Twisted-Warp | Arc-Welding | Strips |
| | | Gas-Welding | Template shapes |
| | | Spot-Welding | Trays |

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# MARKETS

***Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings***

**NEW YORK NOV. 19, 1945**

## Natural Rubber

MAJOR interest in the field of natural rubber this month swung to London where a four-power conference was scheduled to be held on or about November 20. Originally called by American, British and Dutch interests, delegates from France were invited just prior to the holding of the conference. The meeting was in the nature of another conclave of the so-called Rubber Study Group and the point was emphasized that its purpose was still largely "exploratory." No definite commitments of any kind are expected to result from the meeting.

Reports are still being amassed on rubber conditions in the Far East. The Dutch are still highly optimistic on the possibilities of the early resumption of quantity shipments of natural rubber from Sumatra and Java, once the current native rebellion is quieted. A special committee has been organized in the United States to expedite handling of various commodities from the Netherlands Indies, including rubber, as soon as imports begin arriving in volume. Jacobus F. Frank, well known rubber importer, is a member of this committee.

Two things are now evident with regard to the situation in Malaya: (1) Over 90 percent of all rubber plantations are in fair condition and can begin the early production of rubber; and (2) Transportation and labor are the two major bottlenecks to be overcome before large scale shipments can be resumed. Of the two, British rubber experts claim that transportation is the more serious, since maintenance workers can be taught the technique of tapping quite rapidly and can handle tapping assignments until such time as labor is again recruited from India and other sources. One key to the transportation problem is said to be the use of American trucks under modified terms of the Lend-Lease arrangements.

Prices shown below are ceilings set by the Office of Rubber Reserve, Reconstruction Finance Corporation:

| | C | N-C |
|---|---|---|
| ***Plantations—*** | | |
| Ribbed Smoked Sheets, 1X... | 22½ | 40 |
| Thick Pale Latex Crepe, 1X.. | 22½ | 40 |
| Thin Pale Latex Crepe, 1X.. | 22½ | 40 |
| Thick Brown Crepe, 1X..... | 21⅜ | 38⅞ |
| Thin Brown Crepe, 1X..... | 21⅜ | 38⅞ |
| Thick Remilled Blankets, #1.. | 21⅜ | 38⅞ |
| Rolled Brown or Flat Bark.. | 18 | 35½ |
| Smoked Blankets, #1..... | 21⅜ | 38⅝ |
| Claro Brand 1XRSS..... | 22½ | 40 |
| Sole Crepe Trimmings..... | 22 | 39½ |
| Sole Crepe ..... | 22½ | 40 |
| ***Wild—*** | | |
| Uncut Fines, Crude..... | 15 | 29 |
| Cut Fines, Crude..... | 15½ | 29¾ |
| Cut Fines, Washed & Dried.. | 22½ | 40 |
| Upriver Coarse, Crude..... | 12¾ | 26⅛ |
| Upriver Coarse, Washed & Dried ..... | 20¼ | 37⅛ |
| Caucho Ball, Crude ..... | 11⅝ | 24¾ |
| Caucho Ball, Washed & Dried | 19½ | 37 |
| ***Guayule—*** | | |
| Carload Lots ..... | 17½ | 31 |
| Less than Carload Lots ..... | 18 | 31½ |
| ***Balata—*** | | |
| Surinam Sheet ..... | 42½ | 42½ |
| Manaos Block ..... | 38¾ | 38¾ |
| Colombian Block ..... | 38¾ | 38¾ |
| Peruvian Prime ..... | 38¾ | 38¾ |
| Chicken Wire ..... | 23¼ | 23¼ |
| ***Latex—*** | | |
| Normal, Tank Car Lots ..... | 26 | 43½ |
| Creamed, Tank Car Lots .... | 26¾ | 44¼ |
| Centrifuged, Tank Car Lots.. | 27¾ | 45¼ |
| Heat-Concentrated, Carload Drums ..... | 29½ | 47 |

C for Civilian Use; N-C for Non-Civilian Use.

## Scrap Rubber

Dealers report that new and tighter restrictions by reclaimers on the purchase of scrap rubber have caused extreme dullness in some eastern sections of the country and sharply limited the market everywhere. The importance of segregation is being emphasized on all sides, and recognizing this situation OPA has granted an increase to tire splitters, the net effect of which is expected to result in larger and better segregated scrap materials. Maximum prices for scrap whole pneumatic tire casings when sold by the War Department, Navy Department or the Department of Commerce have been provided in Revised Order 33 to Supplementary Order 94. The same order provided ceilings for scrap inner tubes sold by government agencies. The prices for scrap tire casings range from $14.00 to $20.00 per ton, depending on consuming center, while those for tubes range from 5½ to 6 cents per pound. Prices shown below are ceilings on typical grades of scrap:

**(Prices to Consumers, Delivered Akron)**

| | | |
|---|---|---|
| Mixed passenger tires | ton | $20.00 |
| Beadless truck tires | ton | 26.00 |
| Mixed truck tires | ton | 20.00 |
| Beadless passenger tires | ton | 26.00 |
| No. 1 passenger peelings | ton | $2.25 |
| No. 1 truck peelings | ton | $2.25 |
| No. 2 passenger tubes | lb. | .07¼ |
| Red passenger tubes | lb. | .07½ |
| Black passenger tubes | lb. | .06¾ |
| Mixed passenger tubes | lb. | .06½ |
| No. 2 truck tubes | lb. | .07½ |
| Red truck tubes | lb. | .07¼ |
| Black truck tubes | lb. | .06½ |
| Buffings | ton | 35.00 |
| Bicycle tires | ton | 15.00 |
| Air bags and water bags | ton | 15.00 |
| Boots and shoes | ton | 33.00 |

## Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

**(Prices Net at the Mill)**

| | | | |
|---|---|---|---|
| Peeler, carded, 23/5/3 | lb. | .43½ @ | .44 |
| Peeler, carded, 23/4/3 | lb. | .44½ @ | .45 |
| Peeler, carded, 15/3/3 | lb. | .41½ @ | .42 |
| Peeler, carded, 15/4/2 | lb. | .41½ @ | .42 |
| Peeler, carded, 13/3/3 | lb. | .40½ @ | .41 |
| **CHAFERS** | | | |
| Carded, American, 1 1/16" | lb. | .43½ @ | .44 |
| Carded, American, 1" | lb. | .39½ @ | .48 |

## Sheetings

| | | | | | | |
|---|---|---|---|---|---|---|
| 48x40 | 36 in. | 5.50 | lb. | — | @ | 8.272 |
| 40x40 | 36 in. | 6.15 | lb. | — | @ | 7.398 |
| 40x36 | 36 in. | 6.50 | lb. | — | @ | 7.000 |
| 48x48 | 40 in. | 2.50 | lb. | — | @ | 17.200 |
| 48x48 | 40 in. | 2.85 | lb. | — | @ | 15.087 |
| 56x60 | 40 in. | 3.60 | lb. | — | @ | 12.638 |
| 48x44 | 40 in. | 3.75 | lb. | — | @ | 11.733 |

Note: Prices shown above are ceiling prices set by order of the O.P.A.

## Cotton

The price of middling uplands on the Cotton Exchange has swung in the remarkable range of 101 points since our last report (October 16), high for the period being 24.81 on November 14 and low 23.80 on October 18. The average price for middling uplands for the month of October was 23.84, based on 25 trading days. The steady upward advance of prices since mid-October is attributed largely to political factors, including the fate of the Pace Parity Bill, which far overshadowed crop reports, the resumption of cotton exports as a result of Export-Import Bank credits, and the uncertainty surrounding the consumption of cotton by domestic mills until wage-price policies have been clarified. Although some opposition to the Pace Bill was reported in Congressional circles, it is believed that pending modifications will enable the bill to secure approval. The resumption of exports was made possible by approval of a $100,000,000 credit to finance cotton exports to eight European countries. An additional credit in connection with shipments to the Far East is known to be under consideration, with China reported to be in the market for American cotton. Cotton men are following Washington developments with regard to wage-price controversies very carefully. The Administration is known to be in favor of higher wages, while attempting to hold the line on prices. Cotton prices, however, are not expected to hold to their present level much longer. Quotations for middling uplands on the Exchange follow:

| | Oct. 16 | November 19 | | |
|---|---|---|---|---|
| | Close | High | Low | Close |
| December .... | 23.18 | 24.15 | 24.07 | 24.15 |
| March ..... | 23.27 | 24.12 | 24.05 | 24.10 |
| May ..... | 23.27 | 24.03 | 23.94 | 24.03 |

## Reclaimed Rubber

Demand for reclaim still continues strong from practically all branches of the rubber manufacturing industry, with increased export demand becoming apparent. Slight improvement in the labor situation is reported, and reclaimers are hopeful of stepping up production to meet the increasing demand. Scrap supplies are still reported as being fairly adequate, with reclaimers looking toward larger supplies of natural rubber tire and tube stocks shortly now that production of synthetic tires is beginning to hit its stride. Processes for the satisfactory reclaiming of synthetic scrap are still being developed, although little demand for such scrap is as yet evident. Prices shown below are ceilings on typical grades of reclaim:

| | | | |
|---|---|---|---|
| ***Shoe*** | | | |
| Unwashed ..... | lb. | .07½ @ | .07¾ |
| ***Tube*** | | | |
| Black Tube ..... | lb. | .11¾ @ | .12 |
| Red Tube ..... | lb. | .12½ @ | .12¾ |
| ***Tires*** | | | |
| Black (acid process) ..... | lb. | .08 @ | .08¼ |
| Black, selected tires ..... | lb. | .07 @ | .07¼ |
| Truck, Heavy Gravity.... | lb. | .09 @ | .09¼ |
| ***Miscellaneous*** | | | |
| Mechanical blends ..... | lb. | .05 @ | .06 |
| White ..... | lb. | .13½ @ | .13¾ |

## Ducks

| | | | |
|---|---|---|---|
| Enameling (single filling).... | lb. | — @ | .44¼ |
| Belting and Hose..... | lb. | — @ | .39 |
| Single filling, A grade..... | lb. | — @ | .19¾ |
| Double filling, A grade..... | lb. | — @ | .20¾ |

**LABORATORY PRESSES**

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, and MARCH 3, 1933, of THE RUBBER AGE, published monthly at East Stroudsburg, Pa., for October 1, 1945.

State of New York }
County of New York } ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Peter P. Pinto, who, having been duly sworn according to law, deposes and says that he is the Business Manager of The Rubber Age and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor ,and business managers, are:

Publisher, Palmerton Publishing Company, Inc., 250 W. 57th St., New York 19, N. Y.; Editor, M. E. Lerner, 250 W. 57th St., New York 19, N. Y.; Managing Editor, None; Business Manager, Peter P. Pinto, 250 W. 57th St., New York 19, N. Y.

2. That the owner is (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given):

Palmerton Publishing Company, Inc., 250 W. 57th St., New York 19, N. Y.; P. L. Palmerton, 250 W. 57th St., New York 19, N. Y.; Earl D. Osborn, 40 E. 36th St., New York 16, N. Y.; Peter P. Pinto, 250 W. 57th St., New York 19, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holders appear upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest, direct or indirect, in the said stocks, bonds, or other securities than as so stated by him.

PETER P. PINTO, Business Manager.

Sworn to and subscribed before me this 12th day of October, 1945.
(SEAL) HERMAN CASARNOFF, Notary Public.
(My commission expires March 30th, 1947.)

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# CHEMICAL MARKETS

*New York, Nov. 19, 1945*
*All Prices F.O.B. Works*

### ACCELERATORS

Organic

| | | | |
|---|---|---|---|
| A-1 (Thiocarbanilid) | lb. | .28 | .33 |
| A-10 | lb. | .36 | .42 |
| A-19 | lb. | .52 | .58 |
| A-32 | lb. | .59 | .69 |
| A-77 | lb. | .42 | .55 |
| A-100 | lb. | .42 | .55 |
| Aldehyde ammonia, crystals | lb. | .65 | .70 |
| Altax | lb. | .39 | .41 |
| Beutene | lb. | .59 | .64 |
| B-J-F | lb. | .34 | .39 |
| Butasan | lb. | — | 1.10 |
| Butyl Zimate | lb. | — | 1.10 |
| Captax | lb. | .34 | .36 |
| Crylene | lb. | .40 | .47 |
| Di-Ortho-Tolyguanidine | lb. | .44 | .46 |
| Diphenylguanidine | lb. | .35 | .41 |
| El-Sixty | lb. | .36 | .43 |
| Ethasan | lb. | — | 1.10 |
| Ethyl Tuads | lb. | — | 1.25 |
| Ethyl Zimate | lb. | — | 1.10 |
| Ethylidine aniline | lb. | .42 | .43 |
| Formaldehyde aniline | lb. | .31 | — |
| Guantal | lb. | .39 | .48 |
| Hepteen | lb. | .34 | .39 |
| Hexamethylenetetramine | lb. | .33 | — |
| Lead Oleate, No. 999 | lb. | .13 | — |
| Witco | lb. | .15 | — |
| Ledate | lb. | — | 1.20 |
| Methasan | lb. | — | 1.20 |
| Methyl Tuads | lb. | — | 1.25 |
| Methyl Zimate | lb. | — | 1.20 |
| Monex | lb. | — | 1.25 |
| Pentex | lb. | .74 | .84 |
| Phenex | lb. | .49 | .54 |
| Pip-Pip | lb. | — | 1.63 |
| R & H 50-D | lb. | .42 | .43 |
| R-2 Crystals | lb. | — | 1.55 |
| Rotax | lb. | .44 | .46 |
| Safex | lb. | 1.15 | 1.25 |
| Santocure | lb. | .60 | .67 |
| Selenac | lb. | — | 1.60 |
| SPDX-G | lb. | .53 | .58 |
| Super-Sulfur No. 2 | lb. | .13 | .15 |
| Thiocarbanilid, drums | lb. | .28 | .33 |
| Thiofide | lb. | .39 | .46 |
| Thiotax | lb. | .34 | .41 |
| Thiurad | lb. | — | 1.25 |
| Trimene | lb. | .54 | .64 |
| base | lb. | 1.03 | 1.18 |
| Triphenylguanidine | lb. | .45 | — |
| Ulto | lb. | .99 | 1.04 |
| Ureka | lb. | .50 | .57 |
| Blend B | lb. | .50 | .57 |
| Blend C | lb. | .48 | .55 |
| Vulcanex | lb. | .42 | .43 |
| Vulcanol | lb. | .85 | — |

Inorganic

| | | | |
|---|---|---|---|
| Litharge, domestic | lb. | .07 | .07½ |
| Magnesia, calcined, heavy | lb. | .04 | — |

### COLORS

| | | | |
|---|---|---|---|
| **Blues** [b] | | | |
| Prussian | lb. | .36 | — |
| Ultramarine | lb. | .17 | .27 |
| **Browns** [b] | | | |
| Mapico | lb. | .1135 | — |
| Umber, Turkey | lb. | .04¼ | — |
| **Greens** [b] | | | |
| Chrome | lb. | .23 | — |
| Guignet's Green | lb. | .70 | — |
| **Reds** | | | |
| Antimony crimson, 15/17 | lb. | — | — |
| Indian | lb. | .08¼ | — |
| Domestic (Maroon) | lb. | .11 | — |
| Mapico | lb. | .096 | — |
| Red oxide, pure | lb. | .10 | .12 |
| Rub-Er-Red | lb. | .09¼ | — |
| **Whites** [b] | | | |
| Cryptone No. 19 | lb. | .0560 | .0585 |
| Cryptone CB No. 21 | lb. | .0560 | .0585 |
| Cryptone ZS-800 | lb. | .0825 | .0850 |
| Lithopone: | | | |
| Albalith | lb. | .04½ | .04½ |
| Astrolith | lb. | .04½ | .04½ |
| Azolith | lb. | .04½ | .04½ |
| Ray-cal | lb. | .05½ | .05¾ |
| Rayox | lb. | .14½ | .15¾ |
| Titanox A | lb. | .14½ | .14¾ |
| Titanox B | lb. | .05¾ | .06 |
| Titanox C | lb. | .05½ | .05¾ |
| **Zinc Oxide—American Process** [b] | | | |
| American Azo: | | | |
| ZZZ (lead free) | lb. | .07¼ | .07½ |
| Anaconda, lead free | lb. | .07¼ | .07½ |
| Horsehead Lead Free Brand: | | | |
| Special—3 | lb. | .07¼ | .07½ |
| XX Red—4 | lb. | .07¼ | .07½ |
| Kadox, black label—15 | lb. | .07¼ | .07½ |
| Red label—17 | lb. | .07¼ | .07½ |
| 72 | lb. | .07¾ | .07½ |
| St. Joe, black label | lb. | .07¼ | .07½ |
| green label | lb. | .07¼ | .07½ |
| red label | lb. | .07¼ | .07½ |
| U. S. P.—7, bbls. | lb. | .10½ | .10¾ |

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

| | | | |
|---|---|---|---|
| **Zinc Oxide—French Process:** [b] | | | |
| Florence White Seal—7 bbl. | lb. | .09½ | .09¾ |
| Green seal—8 | lb. | .09 | .09¼ |
| Red seal—9 | lb. | .08½ | .08¾ |
| **Yellows** [b] | | | |
| Cadmolith | lb. | .55 | .60 |
| Chrome | lb. | — | .50 |
| Mapico | lb. | .071 | — |

### BLACKS

(In bags, carload lots)

| | | | |
|---|---|---|---|
| Arrow Compact | | .0355 | — |
| Atlantic | | .0355 | — |
| Certified | | .0355 | — |
| Certified Spheron | | .0355 | — |
| Continental | | .0355 | — |
| Disperso | | .0355 | — |
| Dixiedensed | | .0355 | — |
| Dixiedensed 66 | | .0355 | — |
| Excello | | .0355 | — |
| Furnex | | .03½ | .06 |
| Furnex Beads | | .03½ | .06 |
| Gastex | | .03½ | .06 |
| Kosmobile | | .0355 | — |
| Kosmobile 66 | | .0355 | — |
| Kosmos-Dixie 20 | lb. | .03½ | .06 |
| Micronex (Amarillo) | | .0355 | — |
| Micronex Beads (Amarillo) | | .0355 | — |
| Pelletex | | .03½ | .06 |
| P-33 | | .04 | .06½ |
| Philblack A | lb. | .05 | — |
| Shell Carbon (Del. Midwest) | | .0240 | — |
| Sterling | | .035 | — |
| Supreme | | .0355 | — |
| Thermax | | .0225 | .05 |
| Wyex | | .0355 | — |

### COMPOUNDING MATERIALS

| | | | |
|---|---|---|---|
| Aluminum Flake | ton | 18.00 | 24.50 |
| 99½ %-300 | ton | — | 16.50 |
| 86-90 %-300 | ton | — | 13.50 |
| Asbestine | ton | 16.50 | 20.00 |
| Atomite | ton | — | 27.50 |
| Barium carbonate (98-100%) | ton | 47.00 | 49.00 |
| Barytes | ton | 25.35 | 36.00 |
| Bentonite | ton | 11.00 | 16.00 |
| Blanc fixe, dry | ton | 60.00 | 67.00 |
| Calcene | ton | 37.50 | 43.00 |
| Catalpo (fact) | lb. | .02 | — |
| Clay, Aerfloted, Suprex | ton | 11.00 | 23.50 |
| Aerfloted Paragon | ton | 10.00 | 22.50 |
| Champion | ton | — | 11.00 |
| Crown | ton | — | 11.00 |
| Dixie | ton | 11.00 | 23.50 |
| Kaolloid | ton | — | 9.00 |
| Langford | ton | — | 8.50 |
| Magnolia | ton | — | 10.00 |
| McNamee | ton | 10.00 | 22.50 |
| Par | ton | — | 11.00 |
| Witco | ton | 10.00 | — |
| Kalite No. 1 | ton | 26.00 | 52.00 |
| Kalvan | ton | 100.00 | 126.00 |
| Keystone white | ton | — | 14.00 |
| Magnesium carbonate | lb. | .06¼ | — |
| Mineralite | ton | — | 30.00 |
| Pyrax A | ton | — | 8.40 |
| Rottenstone (powd. Dom.) | ton | 25.50 | 37.50 |
| Rubberol | lb. | — | .17½ |
| Silene EF (calcium silicate) | lb. | .055 | .06 |
| Silical | ton | 65.00 | 85.00 |
| Snowflake white | ton | — | 16.00 |
| Talc, domestic | ton | 14.50 | — |
| Whiting, commercial | ton | 16.00 | 26.00 |
| Witco | ton | — | 6.50 |
| Witcarb R | ton | — | 100.00 |
| Witcarb R-12 | ton | — | 40.00 |
| Wood Flour (100 mesh) | ton | 30.00 | 32.00 |

### MINERAL RUBBER

| | | | |
|---|---|---|---|
| 285°-300° Mineral Rubber | ton | 25.00 | 27.00 |
| Black Diamond | ton | 25.00 | — |
| Dielex | lb. | — | .06 |
| Hard Hydrocarbon | ton | 25.00 | 27.00 |
| MilliMar | lb. | — | .05½ |

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| Aromatics—Rodo #0 | lb. | 4.00 | 4.50 |
| Rodo #10 | lb. | 5.00 | 5.50 |
| Curodex 19 | lb. | 2.75 | — |
| Curodex 188 | lb. | 3.50 | — |
| Curodex 198 | lb. | 4.50 | — |
| Para-Dors | lb. | 4.50 | — |
| Aresklene No. 375 | lb. | .35 | .50 |
| Darvan (dispersing agent) | lb. | .30 | .39 |
| Santomerse S | lb. | .11 | .25 |
| Sponge Paste | lb. | — | .18 |
| Sunproof | lb. | .22¾ | .27¾ |
| Tonox | lb. | .50 | .59 |
| Ty-Ply | gal. | 6.75 | 8.75 |
| Unicel (blowing agent) | lb. | .50 | — |

### SOFTENERS

| | | | |
|---|---|---|---|
| **Acids** | | | |
| Acetic, 28%, bbls. [a] | 100 lb. | 3.38 | 3.63 |
| Nitric, 36 degrees | cwt. | 5.00 | — |
| **Acids, Fatty** | | | |
| Laurex | lb. | .14¾ | .17¾ |
| SL-20 | lb. | .11 | .13 |
| Stearex Beads | lb. | .10 | .11 |
| Stearite | lb. | .10 | — |

| | | | |
|---|---|---|---|
| **Alkalies** | | | |
| Caustic Soda, 76% | cwt. | 2.70 | 5.70 |
| Soda Ash, 58% | cwt. | 1.15 | 2.93 |
| **Oils** | | | |
| Degras, bbls. [a] | lb. | .10 | .12 |
| Para-Flux | gal. | .17 | .18 |
| Para-Lube | lb. | .046 | .048 |
| Petrolatum, amber | lb. | .03¼ | — |
| Pigmentaroil, tank cars | gal. | .20½ | — |
| in drums | gal. | .26½ | .27½ |
| Pine, tanks [a] | gal. | .55 | — |
| Rosin Oil, cmpd. | gal. | .40 | — |
| Rubberol | lb. | .13½ | .14 |
| Rubtack | lb. | .10 | — |
| Seedine, e.l. | lb. | .07¼ | — |
| Witco Palm Oil | lb. | — | — |
| Witco Softener No. 20 | gal. | .20 | — |
| Woburn No. 8, e.l. | lb. | .06 | — |
| **Resins and Pitches** | | | |
| Pitch, Burgundy | lb. | .08 | — |
| coal tar | ton | 19.00 | 22.00 |
| hardwood | ton | 16.00 | 22.50 |
| pine, 200 lb. gr. wt. | bbl. | — | 4.50 |
| Pigmentar, tank cars | gal. | .20½ | — |
| in drums | gal. | .26½ | .27½ |
| Retort Pine Tar, drums | gal. | .26½ | .27½ |
| **Solvents** | | | |
| Acetone, pure [a] | lb. | .07 | — |
| Benzene, 90%, tank car | gal. | .14 | — |
| Beta-Trichlorethane | gal. | — | .20 |
| Bondogen | lb. | .98 | 1.25 |
| Carbon, bisulfide | lb. | .05 | .08¼ |
| Carbon tetrachloride | gal. | .73 | 1.27 |
| Dichlorethylene | lb. | — | — |
| Dipentene, cml., drums | gal. | .48 | .50 |
| Ethylene dichloride | lb. | .07½ | .08¼ |
| Plastogen | lb. | .07¾ | .12 |
| Reogen (drums) | lb. | .11½ | .15 |
| Rub-Sol | gal. | .09½ | — |
| Trichlorethylene | lb. | .08 | .09¼ |
| Turpentine, steam dist., drums | gal. | .80 | .83 |
| **Waxes** | | | |
| Antisol | lb. | .22½ | .23½ |
| Beeswax, white [a] | lb. | .58 | — |
| Carnauba, yellow [a] | lb. | .83¼ | — |
| Ceresin, white, dom. | lb. | .13½ | .15 |
| Montan, dom. | lb. | .30 | .35 |
| Paraffin [a] | | | |
| Yellow crude scale, 124/126 | lb. | .04¼ | — |
| Refined, 120/122 | lb. | .05¼ | — |

### ANTI-OXIDANTS

| | | | |
|---|---|---|---|
| Agerite Alba | lb. | 1.95 | 2.03 |
| Gel | lb. | .52 | .54 |
| Hipar | lb. | .61 | .63 |
| Powder | lb. | .40 | .42 |
| Resin | lb. | .43 | .45 |
| Resin D | lb. | .40 | .42 |
| White | lb. | 1.23 | 1.33 |
| Albasan | lb. | .69 | .74 |
| Antox | lb. | .54 | .56 |
| B-L-E | lb. | .40 | .49 |
| Flectol H | lb. | .40 | .47 |
| Neozone A, C, D, E | lb. | .40 | .63 |
| Oxynone | lb. | .77 | .90 |
| Retardex | lb. | .44½ | .47¼ |
| Santoflex B | lb. | .40 | .47 |
| Santoflex BX | lb. | .54 | .61 |
| Santovar O | lb. | 1.15 | 1.40 |
| S.C.R. | lb. | .32 | .34 |
| Stabilite | lb. | .48 | .50 |
| Stabilite Alba | lb. | .69 | .74 |
| VGB | lb. | .43 | .52 |

### EXTENDERS

| | | | |
|---|---|---|---|
| Naftolen R-100 | lb. | .10 | .12 |

### LUBRICANTS—MOLD & RUBBER SURFACE

| | | | |
|---|---|---|---|
| Aresklene | lb. | .35 | .50 |
| Cocoa Soapstock | lb. | .06 | .08 |
| Colite | gal. | .90 | 1.15 |
| Dipex | lb. | .06 | .08 |
| Glycerized Liquid Lubricant | gal. | — | 1.35 |
| Lubrex | lb. | .25 | .30 |
| Mineralite | ton | — | 30.00 |
| Sericite | ton | 65.00 | 75.00 |
| Soap Tree Bark, cut, sifted | lb. | .06 | .08 |

### FACTICE OR RUBBER SUBSTITUTES

| | | | |
|---|---|---|---|
| Amberex | lb. | .25 | — |
| Amberex Type B | lb. | .18¾ | — |
| Black | lb. | .08½ | .13 |
| White | lb. | .09 | .15 |
| Brown | lb. | .10 | .14 |
| Neophax A | lb. | .16½ | — |

### VULCANIZING INGREDIENTS

| | | | |
|---|---|---|---|
| Dispersed Sulfur No. 3 | lb. | .08 | .12 |
| Sulfur Chloride, yellow (drs.) | lb. | .03 | .08½ |
| Sulfur, rubber makers | | | |
| Refined (bags) | cwt. | 2.55 | — |
| Commercial (bags) | cwt. | 2.20 | — |
| Telloy | lb. | 1.75 | — |
| Vandex | lb. | 1.75 | — |
| Vultac No. 1 | lb. | .38 | .43 |
| Vultac No. 2 | lb. | .38 | .43 |
| Vultac No. 3 | lb. | .42 | .49 |

# RUBBER RECLAIM PLAYS A PART!

In hundreds of finished rubber products ranging from stair treads to sponge rubber, raincoats to running boards, toy tires to truck tires, boots to batteries—Buffalo Reclaim has a vital role.

"TIOGA" and "MODIFIED 5203" are recommended as *typical* reclaims with *timely* application. Both products, as are all Buffalo Reclaims, are subject to rigid laboratory control. This assures high-quality standardized grades that bring speed and economy to compounding and processing.

## TIOGA

**DESCRIPTION:**

Black Tire Carcass Reclaim with moderate carbon black content. It is rich in rubber and light in gravity.

**USAGE:**

Tire and belt carcass compounds—soft and hard rubber sponge—molded mechanicals, etc.

**AVERAGE:**

| | |
|---|---|
| Specific Gravity | 1.121 |
| Rubber Hydrocarbon | 62.31% |
| Carbon Black | 8.41% |

## MODIFIED 5203

**DESCRIPTION:**

No. 1 Peel Reclaim of superior processing qualities—imparts excellent resistance to abrasion—possesses high black content.

**USAGE:**

Formulated for use with GR-S in treads and sidewalls of high grade tires—in covers for hose and belting—in footwear.

**AVERAGE:**

| | |
|---|---|
| Specific Gravity | 1.175 |
| Rubber Hydrocarbon | 48.53% |
| Carbon Black | 22.04% |

*Samples, quotations and full particulars on request*

**U. S. RUBBER RECLAIMING COMPANY, INC.**

**500 FIFTH AVENUE • NEW YORK 18, N. Y. • (Plant at Buffalo, N. Y.)**

**TRENTON . . . H. M. ROYAL, Inc., 689 Pennington Avenue • TORONTO . . . H. VAN DER LINDE, Ltd., 156 Yonge Street**

*63 Years Serving the Industry Solely as Reclaimers*

# WANT ADS

RATES: Eight cents per word, minimum charge $3.00, except POSITIONS WANTED, $1.00 for 40 words or less, extra five cents per word. All classified advertisements payable in advance. Address replies to box numbers care of RUBBER AGE, 250 West 57th St., New York 19, N. Y.

## POSITIONS WANTED

RUBBER CHEMIST: Eight years' experience in compounding rubber, synthetic rubbers, and thermoplastic resins for wire and cable for extrusion, molding and calendering operations. Will also consider the mechanical goods and adhesive fields associated with these materials. Address Box 1775, RUBBER AGE.

EXECUTIVE, U. S. citizen, over 20 years' experience buying and selling crude rubber, latex and kindred products, also foreign sales agent for large American rubber manufacturers, seeks position in same or allied field. Thoroughly familiar with domestic and foreign markets. Speaks French and Malay. Excellent references. Address Box 1855, RUBBER AGE.

MANAGEMENT—Do you need someone to make your plant a success? A man with unusual experience in operation, sales, and technology is available. Address Box 1895, RUBBER AGE.

FACTORY SUPERINTENDENT associated with the rubber industry for the past 30 years desires connection with a progressive organization. Thoroughly experienced in compounding of natural, synthetic and reclaimed rubbers, also plastics, mixing and milling, calendering, spreading, curing and finishing of mechanical goods, hard and soft rubber specialties, sponge rubber, tubing, drug sundries, etc. Capable of efficiently directing all production operations; a thorough knowledge of costs and numerous trade connections. Eastern location desired. Address Box 2000, RUBBER AGE.

CAN YOU USE THIS MAN? Has 15 years' experience. Last 8 with national rubber manufacturer in top-management, sales, advertising, and coordination of departments. Young, healthy, college graduate. A real worker. Can plan and lead others. Will go anywhere as branch manager, general executive sales manager, or administrative assistant. Will guarantee profits to my employer. Address Box 2012, RUBBER AGE.

PRESS AGENT, 23 years' background, now employed as "Public Relations expert." Washington, New York and Midwest background. Seeks field where experience and willingness to plan and work will show results. $6,000. Address Box 2013, RUBBER AGE.

FACTORY MANAGER, 25 years' experience in the rubber industry in a wide variety of products, specializing in the proofing of fabrics with natural and synthetic rubber, plastics, resins, and unsupported films. Excellent knowledge of compounding, mixing, calendering, and spreading. Address Box 2018, RUBBER AGE.

PLANT MANAGER, experienced footwear, latex, reclaim, reclaim dispersions molded goods. Available short notice. Address Box 2020, RUBBER AGE.

## HELP WANTED

TECHNICAL SALES REPRESENTATIVES—RUBBER. Large Eastern company marketing organic chemicals on national scale has openings for men with chemical background in expanding rubber sales organization. Applicants should have good background in compounding and processing. In reply give information on education, age, qualifications, experience and salary expected. Include small photograph. Address Box 1861, RUBBER AGE.

CHEMIST, assistant, young, some rubber, synthetic rubber and plastics experience for research and development work. Good opportunity. Metropolitan New York City area. Complete resume. Address Box 1862, RUBBER AGE.

ENGINEER—Capable of complete supervision of steam, air and hydraulic power. Write giving complete education, experience, and qualifications. Midwestern rubber company. Address Box 1885, RUBBER AGE.

**TIRE AND TUBE DEVELOPMENT AND CONSTRUCTION ENGINEERS—Excellent opportunity in progressive Eastern company. Unlimited opportunity for advancement. Salary commensurate with ability. Address Box 1888, RUBBER AGE.**

ESTIMATOR for modern rubber plant, producer of molded goods, hose and sheet stock. Excellent opportunity for experienced man capable of organizing and supervising new cost department. Address Box 200?, RUBBER AGE.

REPRESENTATIVES WANTED to sell rubber and latex compounds, Resin Emulsions and Curing Dispersions. Excellent salary and commission for right men. Do not apply unless you are thoroughly experienced and have a good following. Address ADHESIVE PRODUCTS CORPORATION, 1660 Boone Avenue, Bronx 60, N. Y.

ENGINEER—Capable of taking over complete charge of maintenance of buildings and grounds and architectural work for Midwestern rubber company. Write, giving complete education, experience, and qualifications. Address Box 1886, RUBBER AGE.

TECHNICAL SALES REPRESENTATIVES—Experienced technical salesmen for latex concentrate compounds and adhesives. Address Box 2010, RUBBER AGE.

## HELP WANTED (Continued)

**TIRE CURING FOREMAN—Must have experience and capability in supervising tire production. Permanent position with attractive salary for man with resourcefulness and ability. Eastern concern. Specify all qualifications first letter. Address Box 1889, RUBBER AGE.**

### SUPERINTENDENT TO TAKE COMPLETE CHARGE MECHANICAL GOODS PLANT

Must know mill room, processing operations, planning and scheduling thoroughly. Also qualified to organize and direct entire plant personnel. State background of experience and education. Good salary and bonus. Address Box 1894, RUBBER AGE.

CHEMIST who has had experience in compounding synthetic rubbers for molded and wrapped goods, including rubber covered rolls. Small plant; western Pennsylvania. Address Box 1896, RUBBER AGE.

CHEMIST or CHEMICAL ENGINEER—age 25 to 30—some experience or educational background in lacquer formulation and testing. Good working conditions, excellent opportunity. Write Personnel Department, BRUNSWICK-BALKE-COLLANDER CO., Muskegon, Mich.

CHEMIST or CHEMICAL ENGINEER—age 25 to 30—some experience in rubber compounding for experimental work in developing new formulas and processes. Good working conditions, excellent opportunity. Write Personnel Department, BRUNSWICK-BALKE-COLLANDER CO., Muskegon, Mich.

ENGINEER—Position open for two process machinery design engineers in Midwestern rubber company. Write giving complete education, experience and qualifications. Address Box 1887, RUBBER AGE.

**TIRE FINISHING SUPERVISOR—Opening for man with experience in supervising duties connected with cured tire final finishing. Position offers excellent opportunity for advancement. All replies confidential. Address Box 1890, RUBBER AGE.**

PRACTICAL RUBBER CHEMIST capable of designing and developing compounds with natural or synthetic rubbers. Must be able to supervise small laboratory force and do control testing. Experience in heels and soles desirable, but not essential. In reply state qualifications and salary desired. Address Box 1897, RUBBER AGE.

**CHEMIST OR CHEMICAL ENGINEER, experienced in the development and quality control of packings and gaskets. Address Box 1898, RUBBER AGE.**

**PLANT MANAGER to operate an established factory in Philadelphia area employing 200 in the manufacture of engineered rubber and synthetic rubber specialties. State qualifications including age, education, experience in handling production, costs, labor. Technical training helpful but not essential. Permanent position wtih excellent opportunity for advancement. Address Box 1899, RUBBER AGE.**

**TUBE ROOM SUPERINTENDENT OR FOREMAN—Must be capable of supervising all tube room operations. Opening offers unlimited opportunity for man of experience and capability. Progressive Eastern concern. All replies strictly confidential. Address Box 1891, RUBBER AGE.**

RUBBER CHEMIST or one who has had some experience in compounding rubber. Excellent opportunity for right man. Write full details of your experience. ROSE RUBBER PRODUCTS CO., 174 First Ave. N., Nashville, Tenn.

CHEMIST with thorough experience in adhesive cements and industrial coatings made with natural or synthetic rubber. Attractive salary for man with proper experience. Address Box 2002, RUBBER AGE.

FOREMAN or EXPERIENCED CALENDER OPERATOR. Experience and qualifications must be of high type. Modern plant in central New Jersey. Address Box 2008 RUBBER AGE.

### WANTED

Man experienced in handling miscellaneous grades scrap rubber. Reply giving experience and age. Address Box 2009, RUBBER AGE.

RUBBER TECHNOLOGIST with sound chemical background for development of new chemicals and their use in natural and synthetic rubbers. Age to 40 years. Address Box 2011, RUBBER AGE.

PHYSICAL CHEMIST for Research Laboratory of Middle West rubber company. Must have good educational background and ability to head group in Polymerization research. Excellent salary for qualified person. (Members of Research Laboratory have been notified we are making this request.) Address Box 2014, RUBBER AGE.

ORGANIC CHEMIST for Research Laboratory of Middle West rubber company. Must have good educational background and ability to head group in Organic Synthesis. Excellent salary for qualified person. (Members of Research Laboratory have been notified we are making this request.) Address Box 2015, RUBBER AGE.

## BUSINESS OPPORTUNITIES

We do Rubber Compounding, Light Color Stock Mixings and GR-S Breakdown. FRANK T. BAKER, RUBBER PRODUCTS AND COMPOUNDING, 63 Arch Street, Fall River, Massachusetts.

RUBBER GOODS MFG. PLANT FOR SALE, going, profitable concern with good equipment. Total price $30,000. Address Box 1732, RUBBER AGE.

**TERMINATIONS? CANCELLATIONS? WANTED: Chemicals, Colors, Pigments, Resins, Solvents, Oils, Waxes, Lacquers. Other Materials, Supplies, Equipment, etc. Address Box 1825, RUBBER AGE.**

WANTED TO BUY OR RENT: Coating plant, calendering and/or spreading equipment, floor space. Give full details first letter. Address Box 1892, RUBBER AGE.

RUBBER MANUFACTURER located in New Jersey has open mill mixing capacity for rubber or plastics, particularly suited for colors. Write, advising what you require. Address Box 1893, RUBBER AGE.

LARGE MECHANICAL GOODS JOBBER with over $2,000,000 yearly volume wishes to purchase capital stock of rubber products manufacturing company for mechanical and molded goods or otherwise. All information will be treated confidentially. Address Box 2001, RUBBER AGE.

WANTED: SMALL RUBBER PLANT. Am interested in buying small well balanced rubber plant equipped to produce molded products including heels, soles. Interested also in buying mill room equipment, 3 roll calenders and presses. Address Box 2003, RUBBER AGE.

WORKING PARTNER WANTED for Pacific Coast rubber goods manufacturing plant. Must be thoroughly familiar with latest production methods. $15,000 will purchase half interest. Remarkable opportunity for right party. Address Box 2004, RUBBER AGE.

AVAILABLE: Capacity for compounding and mixing, also calender work. Address Box 2006, RUBBER AGE.

PLASTIC COMPOUNDING AND MIXING FACILITIES WANTED. Will rent or contract plant equipped with Banbury or mills to batch compound and rough sheet flexible and rigid vinyl plastics. Address Box 2017, RUBBER AGE.

## EQUIPMENT WANTED

WANTED: Complete mechanical rubber goods plant equipment, including mills, calender, presses, pumps, Banbury mixer, hose machine, belt press, extruding machine, etc. Send complete description, location and price. Address Box 2005 RUBBER AGE.

WANTED—Hydraulic Presses, with pumps and accumulators, Banbury Mixer, Mills, Calender, Tubers, any condition. Address Box 2016, RUBBER AGE.

WANTED: Laboratory equipment as follows: Analytical balance with weights; tensile tester for soft rubber; tensile tester for hard rubber; aging oven; compression machine; laboratory mill, 6" x 12" roll size. Please give full description and state price. Address HERSHBERG PRODUCTS COMPANY, Ashtabula, Ohio.

WANTED: Heavy duty mills for plastic compounding, 50 x 18 or larger, and rotary cutters #1 or #1½. Equipment must be in good and guaranteed condition. Address ERIC HEIDEN, INC., 22-26 119th Street, College Point, Long Island, N. Y.

WANTED: Heavy duty rubber mill, 20 x 20 x 50" or 20 x 20 x 60" in good running condition. Please give full details in first letter. No dealers please. Address Box 2019, RUBBER AGE.

## EQUIPMENT FOR SALE

FOR SALE: 1—10" x 20" Rubber Mill; 1—8" x 13" Rubber Mill. 1—Stokes Rotary 32 Punch Pre-Form Press. 1—French Oil Mill Hydro-Pneumatic Accumulator. Accumulators up to 6,000 GPM. One set of 18" x 50" Compounding Rolls, Reduction Gear and Motor. NEVER USED Cleveland Speed Reducer, 139 H.P., ratio 8 to 1. Tubers 3¼" to 6". 4—W. & P. Mixers, up to 625 gallon capacity. 10—High Pressure Hydraulic Pumps. 6—Hydraulic Presses 20" x 20", 12" x 14". Dry Mixers, Grinders, Pulverizers, etc. Send for complete list. CONSOLIDATED PRODUCTS COMPANY, INC., 14-19 Park Row, New York 7, New York.

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# INDEX TO ADVERTISERS


Adamson United Co. ... —
Adhesive Products Corp. ... —
Advance Solvents & Chemical Corp. ... 168
Agawam Chemicals, Inc. ... —
Akron Standard Mold Co. ... 241
Albert & Son, L. ... 265
American Anode, Inc. ... 159
American Cyanamid & Chemical Corp. ... —
American Resinous Chemicals Corp. ... —
American Viscose Corp. ... 162, 163
American Zinc Sales Co. ... 170
Angier Products Co., Inc. ... —
Atlas Electric Devices Co. ... —
Automatic Sprinkler Corp. of America ... —

Baker Castor Oil Company ... 187
Baker Chemical Co., J. T. ... 256
Barrett Div., Allied Chemical & Dye Corp. ... 186
Beacon Co. ... 255
Berlow & Schlosser Co. ... 265
Bernstein, Wilburn F. ... 265
Binney & Smith Co. ... Insert Following 224
Bonwitt, Eric ... —
Brockton Cutting Die & Machine Co. ... —

Caldwell Co., The ... 148
Carbide & Carbon Chemicals Corp. ... 146
Carey, Phillip, Mfg. Co. ... 261
Carter Bell Manufacturing Co., The ... 248
CLASSIFIED ADVERTISING ... 264, 265
Cleveland Liner & Mfg. Co. ... Back Cover
Columbian Carbon Co. ... Insert Following 224
Connor, Charles F., & Co., Inc. ... 261
CONSULTANTS SECTION ... 265
Continental Carbon Co. ... 184
Continental Machinery Co. ... 251
Continental-Mexican Rubber Co. ... —

Dispersions Process, Inc. ... Insert Following 156
Du Pont de Nemours & Co., E. I. ... Inside Front Cover

El Dorado Oil Works ... 253
English Mica Co. ... 261
Erie Engine & Mfg. Co. ... 239

Farrel-Birmingham Co., Inc. ... 177
Firestone Tire & Rubber Co. ... 153
Flintkote Co., The ... —
Franklin Research Co., Inc. ... 250

Gammeter, W. F. Co. ... 259
Gardner-Richardson Co. ... 167
General Atlas Carbon Co. ... 152
General Chemical Co. ... 158
General Latex & Chemical Corp. ... 172
General Magnesite & Magnesia Co. ... 241
Gidley, Philip Tucker ... 265
Goodrich, B. F., Chemical Co. ... 143, 154, 155
Goodyear Tire & Rubber Co., Plastic and Chemical Div. ... 147

Hall Co., The C. P. ... 245
Herron Bros. & Meyer ... —
Heveatex Corporation ... 247
Huber, J. M., Inc. ... 194
Hycar Chemical Co. ... 141

Independent Die & Supply Co. ... 256
Industrial Oven Engineering Co. ... 252
Industrial Rayon Corp. ... 191

Jacoby, Ernest & Co. ... 259
Johnston Corp., The ... 257
Johnson, S. C., & Son, Inc. ... —

Littlejohn & Co., Inc. ... —
Loewenthal Company ... 164
Ludlow-Saylor Wire Co. ... 259

M & N Machine & Tool Works ... 261
Magnetic Gauge Co. ... —
Marbon Corp. ... —
Market Forge Co. ... 253
Mercer-Robinson Company, Inc. ... 255
Metallurgical Service Co. ... 258
Meyer & Brown, Inc. ... 258
Meyercord Company ... —
Monsanto Chemical Co. ... 151
Moore & Munger ... —
Mt. Vernon—Woodbury Mills, Inc. ... 180
Muehlstein & Co., H., Inc. ... —
Mumper, James F. ... 265

National Lead Co. ... 188
National Rosin Oil & Size Co. ... 261
National Rubber Machinery Co. ... 166
National Sherardizing and Machine Co. ... 261
National-Standard Co. ... —
Naugatuck Chem. Div., U. S. Rubber Co. ... 196, Insert Fololwing 156
Neville Co. ... 252
New Jersey Zinc Co. ... 156
New Wrinkle, Inc. ... 253
Niagara Alkali Company ... 149

Olin Laboratories, The R. R. ... 265

Pancorbo, M. ... —
Pennsylvania Industrial Chemical Corp. ... —
Pequanoc Rubber Co. ... 182
Philadelphia Rubber Works Co. ... 144
Phillips Petroleum Co. ... 142, 239
Pittsburgh Corning Corp. ... 165
Pittsburgh Plate Glass Co., Columbia Chemical Div. ... —
Polymel Corp. ... —
Powdered Material Research Laboratories ... 265
Precision Scientific Co. ... 181
Preventive Maintenance Co. ... 251
Procter & Gamble ... 249
%Proportioneers, Inc.% ... 189
Protective Coatings, Inc. ... 261
Protectoseal Company ... —

Rand Rubber Co. ... 261
Randall, Frank E. Co. ... 254
Rare Metal Products Co. ... 258
Rayon Processing Co. of R. I., The ... 254
Reichhold Chemicals, Inc. ... 171
Resinous Products & Chemical Co. ... 169
Revertex Corp. of America ... 252
Robinson Mfg. Co. ... 255
Rohm & Haas Company ... 169
Royle & Sons, John ... 193

St. Joseph Lead Co. ... 150
Schrader's Son, A. ... 178
Schulman, A., Inc. ... Inside Back Cover
Scott Testers, Inc. ... 247
Sharples Chemicals, Inc. ... 183
Shell Oil Co., Inc. ... —
Simplex Cloth Cutting Machine Co., Inc. ... 249
Sinclair Collins Company ... 255
Skelly Oil Co., Solvents Div. ... —
Snell, Foster D., Inc. ... 265
Southeastern Clay Co. ... —
Spadone Machine Co. ... —
Stamford Rubber Supply Co. ... 266
Stanco Distributors, Inc. ... 185
Stanco Incorporated ... 160
Standard Chemical Co. ... 179
Stanford Engineering Co. ... 257
Stauffer Chemical Co. ... 249
Stearns Magnetic Mfg. Co. ... —
Sun Oil Co. ... 243

Taber Instrument Corp. ... —
Tanney-Costello Co. ... —
Textile Proofers, Inc. ... 246
Thropp & Sons, William R. ... —
Titanium Pigment Corp. ... —
Turner Halsey Co. ... 180

Union Bay State Chemical Co. ... 161
Union Carbide & Chemical Corp. ... 146
United Carbon Co. ... Insert Following 174
United Engineering & Foundry Co. ... —
U. S. Rubber Reclaiming Co. ... 263
U. S. Stoneware Co. ... —
Utility Mfg. Co. ... 257

Vanderbilt, R. T., Co. ... Front Cover

Waldron Corp., John ... —
Weller Chemical Co. ... 259
White Products Co., J. J. ... 251
Whittaker, Clark & Daniels, Inc. ... 190
Williams, C. K., & Co. ... 259
Wilmington Chemical Corp. ... 145
Witco Chemical Company ... 184

Xylos Rubber Co. ... 153



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